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COLLEGE SENIORS

AND

FEDERAL EMPLOYMENT

Report of a research study
conducted by

THE AMERICAN UNIVERSITY

FOR

Division of
Psychological Sciences
Office of Naval Research

Charles M. Hersh
Principal Investigator

THE AMERICAN UNIVERSITY
Washington, D. C.
January, 1953

C O L L E G E S E N I O R S

AND

F E D E R A L E M P L O Y M E N T

Report of a research study conducted by The American University with funds provided by the Division of Psychological Sciences, Office of Naval Research, Contract Nonr 288(00).

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T H E A M E R I C A N U N I V E R S I T Y

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABES (Cont'd)

LIST OF FIGURES

CHAPTER I

INTRODUCTION

In the Spring of 1951, George P. Bush conducted a study for The American University under contract with the Office of Naval Research to determine why college seniors in engineering in the June graduating classes did or did not apply for federal employment. This study was of a pilot nature to develop the information necessary for a fuller study of the attitudes of college seniors toward federal employment in engineering and other fields. As a result of the Bush report, the Office of Naval Research contracted with The American University to carry on the fuller study of college seniors in science, engineering and social science.

The full scale survey was conducted in the Spring of 1952 for college majors in mechanical engineering, electrical engineering, civil engineering, physics, chemistry, economics, psychology and political science. Through questionnaires and interviews college seniors, college placement officers and departmental faculties were canvassed as to their attitudes toward industrial and federal employment. The results of the survey are presented in this report.

The method included selection of a sample of colleges and of students within the colleges. Questionnaires and interviews were administered on the college campuses with careful supervision to assure the reliability of the information. The person who reviews the report will note the use of tests of validity and reliability. The preciseness of the study was considered to be especially important in an area in which the judgments of observers have not been verified by systematic studies of attitudes and behavior. This study, of course, has its limitations which will be noted throughout the report. We do believe, however, that it makes a substantial contribution to our understanding of the problem of recruiting college graduates for federal employment.

It is not within the scope of this study to evaluate the federal recruiting program. The report is oriented around the need to build a more accurate description of college seniors' attitudes and behavior in the federal recruitment process and is in the form of a monograph.

Although the report has been prepared by the principal investigator, he has received the counsel and assistance of persons particularly qualified at various points in the research process. He had the benefit of an advisory committee from the Department of Political Science and Public Administration, The American University, consisting of Catheryn Seckler-Hudson, George P. Bush, Lowell H. Hattery and Harold H. Roth, and Robert Bower of the Bureau of Social Science Research. Dr. Ralph Hogan and Dr. Howard Page of the Office of Naval Research provided helpful counsel, as did Harry Alpert of the Division of Statistical Standards of the Bureau of the Budget. Additional counsel on statistical methods related to the attitude survey was given by Dr. Harold F. Gosnell of the part-time faculty of The American University. The field work connected with the study was carried out entirely by the principal investigator and Lowell H. Hattery. Thomas Gorman, graduate student at The American University, served as junior statistician on the project and contributed Appendix F.

Perhaps the greatest appreciation should be extended to the administrative officers, the faculty and the students of the colleges and universities. At Syracuse University, Johns Hopkins University, University of West Virginia, Purdue University and Oberlin College the helpfulness and willingness to give of their time to the study was most gratifying on the part of both staff and students.

CHAPTER II

OBJECTIVES AND METHOD

The high degree of technological development achieved in our American society has dramatized the importance of our human resources. Today, perhaps even more than in the past, day-to-day operation of industrial, educational, governmental and other important organizations has become critically dependent upon knowledge and skills of persons highly trained in science, engineering, social science and other fields.

It is in our common interest to be concerned about the development, distribution, effective use, and conservation of our human resources. So today we find educators, industrial leaders, government officials, professional people, and many others studying our human resources, following the leadership of the Office of Scientific Personnel of the National Research Council and of the former Manpower Branch of the Human Resources Division, Office of Naval Research.

The American University under contract with the Office of Naval Research, has sought to study one crucial factor in the distribution of our human resources, that is: the employment preferences of college students. Colleges and universities play an essential role in the development of highly trained men and women. The distribution of these highly trained persons among the social organizations dependent upon their knowledge and skills is influenced by many factors, one of which is the individual college senior's preference concerning the various employment opportunities open to him. Cooperative effort to meet the manpower needs of industry, educational institutions, and government is dependent upon a more precise understanding of how college students choose specific jobs.

The study has been restricted to college seniors majoring in three fields of engineering: civil, mechanical, and electrical; two fields of science: chemistry and physics; and three fields of social science: economics, political science, and psychology.

A pilot study was conducted in the Spring Semester of 1951. It was directed toward engineering majors only, and was conducted at six colleges or universities. Dr. George P. Bush, the principal investigator for that study, presented his findings in July 1951 in a report entitled Engineering

Students and Federal Employment. [1] A summary article by Drs. Bush and Hattery entitled "Federal Recruitment of Junior Engineers" appeared in Science in November 1951 [2] and is reproduced in Appendix A.

The second approach to the problem was made during the Spring Semester, 1952. The scope of the study was extended to include science and social science majors as well as engineering majors. Five institutions were visited.

In addition to contacting students directly, these studies have provided opportunity to contact placement officers, deans, other administrative officials, and faculty members familiar with student employment preferences and the recruitment efforts of organizations seeking college level talent.

Pilot Study

The need for research into the employment preferences of college seniors arose from student response to a Civil Service Commission examination announcement for federal positions as "Junior Scientists and Engineers" in the fall of 1950. This experience led to a research contract, calling for a study by The American University. The contract called for a study "... to determine reasons why college students do not apply for Government employment in science and engineering ..." The contractor was to "... conduct a study through use of interviews, questionnaires, and visits ..."

The Bush visits to college campuses were exploratory, designed to build a description of the variety of student attitude toward federal and industrial employment. A large volume of student and faculty comment concerning the advantages and disadvantages of federal and industrial employment in their fields of training was obtained. The point of departure for the current study was this description of student and faculty attitudes concerning employment which was discovered and documented in this pilot study.

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[1] Bush, George P., Engineering Students and Federal Employment. Washington, D. C.: The American University, 1951.

[2] Bush, George P., and Hattery Lowell H., "Federal Recruitment of Junior Engineers," Science, Volume 114: 455 - 458 (November 1951).

Research Philosophy of Current Study

The central purpose of this research is to describe, analyze, and evaluate the process by which college seniors are recruited for civilian employment. Our focus of attention is upon that phase of the process which can be observed at the colleges. Our principal data concern the student and his job decision, the end-product of the recruitment process.

In the ideal circumstance a social process, recruitment or any other, is most adequately described by direct systematic study of all those situations which occur during day-to-day operation of the process. Recurrent patterns of (1) behavior, (2) attitude, and (3) cultural understandings or expectancies provide primary data for description of the process. Ordinarily all situations cannot be observed in detail, so some sampling of situations is made. Systematic study of these situations provides data upon which generalizations about the social process should be based.

As in most studies, research following this ideal pattern would have been too costly and time consuming. Visits to the colleges provided some observational data concerning the recruitment process. We saw the physical plants and talked with students, faculty, and administrative officers.

The approach was to follow a short cut to description of the recruitment process. We contacted participants in that process directly and systematically but apart from situations actually occurring in the process. It is assumed in this approach that participants can recall and describe accurately behavior concerning their job decisions. It is also assumed that their attitudes and cultural understandings can be determined accurately apart from situations occurring in this process. Thus attitude research has been regarded a signifitool in analysis of the recruitment process.[3]

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[3]For amplification of this point of view see: Krech, David, and Crutchield, Richard S., Theory and Problems of Social Psychology, 1st edition, New York: McGraw-Hill Book Company, Inc., 1948. For example, these authors conclude, "...A complete picture of a man's beliefs about and attitudes toward various aspects of his social world will yield highly reliable predictions about his behavior in various social situations." (Page 150).

Objectives of Current Study

In a meeting of the American University advisory committee held in March 1952 the specific objectives of this research into the recruitment process were stated:

(1) To measure more precisely students' attitudes toward federal employment as compared with industrial employment.

(2) To discover the degree to which students' attitudes concerning the advantages and disadvantages of of federal and industrial employment derived from interview and questionnaire comment in the pilot study influence student job decisions.

(3) To discover (a) the sources of information concerning employment which influence the student as he makes his job decision and (b) the relative values which he assigns to these sources.

(4) To discover the attitudes of faculty members toward the factors of employment influencing students, faculty members' sources of information, and the relative values they assign to these sources.

(5) To compare:

(a) Student and faculty attitudes and sources of information.
(b) Attitudes of engineering students with those of science and social science students.

(6) To determine the time when college seniors make their final decision to accept or reject specific employment opportunities.

These aims require a comprehensive description of student behavior and attitude in the recruitment process, and a limited description of faculty members' sources of information concerning employment and attitudes toward employment. To these ends research procedures were designed.

Bibliography

Background research was conducted by construction and general use of a bibliography which is presented in Appendix B of this report.

The Questionnaire

Since the questionnaire was relied upon as the primary tool of research, it was designed to collect a variety of data. Inspection of the questionnaire (Appendix C) will show six major divisions.

(1) Thirty-eight attitude statements arranged as a scoring schedule to measure the degree of favor toward federal compared with industrial employment.

(2) A question designed to discover the most important consideration in the final choice of a job.

(3) Three questions with anticipated categories of response and a free-answer alternative to obtain a description of sources of employment information and advice.

(4) A detailed description of the job decision.

(5) Description of previous employment experience.

(6) General classifictory information.

This questionnaire is the product of a pre-test conducted at American University and several critical sessions with University and other experts on questionnaire construction.

One part of the questionnaire requires a detailed explanation: the thirty-eight attitude statements. These statements paraphrase student response in the pilot study in the areas of the most frequently stated advantages and disadvantages of both federal and industrial employment. Each statement draws a comparison between industrial and federal employment. Following each statement are five alternative responses. These present adjective descriptions of intensity of favor-disfavor toward the statement. The following adjectives are used: "strongly agree", "tend to agree", "neither agree nor disagree or don't know", "tend to disagree", and "strongly disagree".

Numerical values from zero to four were used to score student response to each statement. Zero designates strong favor for industrial employment, two designates neutrality or don't know, and four designates strong favor for federal employment. The manner in which numerical values were assigned to the attitude variable is illustrated in Figure I.

SCALE VALUES

0.0	1.0	2.0	3.0	4.0
Strong favor for industrial employment	Tend to favor industrial employment	Neutral or don't know	Tend to favor federal employment	Strong favor for federal employment

Figure I

Response to each statement was scored so that it could be added to scores of the other statements to obtain average attitude scores which would be in the scale values presented in Figure I. Seventeen statements were worded so that agreement with any one of them was favorable to industrial employment and disagreement favorable to federal employment. The adjective response boxes appearing after these statements were scored zero to four respectively. Twenty-one statements were worded so that agreement with any one of them was favorable to federal employment and disagreement favorable to industry. The adjective response boxes appearing after these statements were scored four to zero respectively. Thus, one numerical value on the a priori attitude scale[4] was obtained by response to a single statement. An individual's scores, on all of the thirty-eight statements were totaled and averaged to obtain his attitude score. Average attitude scores of individuals were totaled and averaged to obtain attitude scores for groups.

Appendix D provides a detailed description of this scoring schedule for measuring attitude and the results of its application in this study. It should be noted that the form of the thirty-eight statements permits testing of response following the method of scale analysis. Such a test has been completed and is described in Appendix E.

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[4]A scale in which values are assigned by the researchers. For further discussion of the attitude scale see Appendix D.

Interviews

During visits to the colleges interviews were sought with faculty members, heads of departments, placement officers, and deans. Students volunteered information in informal interviews following administration of the questionnaire. A dictation machine was used by the researchers to record all interviews as soon as possible after they occurred. Later such interview records were transcribed and filed in the outline headings of the study. Thus, although a sampling technique was not employed, valuable suggestive and illustrative data were collected in these interviews.

Treatment of data

Questionnaire response was coded, placed on punch-cards, and machine tabulated. A sample of fifty questionnaires was drawn from the total 835 to establish a tentative code. Response to free-response questions was inspected and a code formulated. All questionnaires were then coded. A check was made by drawing another sample of fifty questionnaires. Twenty-nine single code items were in error. These errors were distributed over fifteen questionnaires. On the fifty questionnaires in the sample there were approximately 3700 coded items. Thus, the percentage error in coding is on the order of eight-tenths of one percent.

Machine tabulation was conducted in three steps. First a complete listing of all cards and a tabulation of response to all questions were made. Then, after initial analysis of the tabulated data, cross tabulations were made. Finally a separate series of machine operations was conducted to perform scale analysis of the attitude statements.

Sampling theory

Generalizations concerning the specific objectives of this study could concievably be made by sampling students and faculty at one institution. In such a case these generalizations would be severely limited in usefulness. On the other hand, generalizations concerning the universe of insitutions producing senior students in the eight major fields of our interest could only be made after sampling such a universe. In either case our attention would be focussed upon the institution as a unit. The research design assumes student and faculty attitudes and behavior occur in specific institutional settings and that the setting may vary from institution to institution.

Keeping in mind the cost and administrative problems involved in obtaining a sample of colleges and universities representative of the Universe of such institutions in the United States, the American University advisory committee determined to conduct field research at more than one institution but not to draw a representative sample. Five institutions were chosen to permit some comparison of student and faculty opinion among schools. Johns Hopkins University, the University of West Virginia, Oberlin College, Syracuse University, and Purdue University were chosen. Variation in size of student body, private or public ownership, strength of curricula in different fields, proximity to federal agencies, academic caliber of graduates, and other characteristics are known to exist or are assumed to exist at these schools. West Virginia University was also included in the pilot study and provides a comparison with data previously collected.

Once the five colleges were chosen, sampling problems became evident. How many students should be contacted at each school? How should they be chosen? The advisory committee approved field study of eight major fields: electrical engineering, chemical engineering, mechanical engineering, physics, chemistry, psychology, political science, and economics. The intent behind this expansion beyond that of the pilot study was to obtain comparison of student attitudes of engineering majors with science majors and with social science majors. Thus, enough students in these three general categories must be contacted to admit discovery of statistically significant differences in response.[5]

The size of sample or number of students contacted in each field at any college should be maximized, the total dependent upon the administrative problems involved. The more students contacted the greater the possibility that small percentage differences will be statistically significant. This holds however only when randomness is insured, so our attention was focused on administrating the student questionnaires to obtain random selection. Perhaps the most important administrative consideration is that once a list of students is finally chosen, every effort must be made to administer questionnaires to them all.

Administration of the Questionnaire

With these sampling requirements in mind, administration of the questionnaire had to be tailored to meet the conditions at each institution. The general approach was to

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[5]Parten, Mildred B., Surveys, Polls, and Samples, New York: Harper and Brothers, 1950. It's not feasible to present here a full discussion of the sampling theory involved.

contact the president of a college to obtain permission to conduct the study. At the two largest institutions, Purdue University and Syracuse University, a preliminary visit was made following this initial contact in order to arrange selection and notification of the students. In the cases of Oberlin College, West Virginia Univeristy, and Johns Hopkins University this first contact was followed by telephone contact with the administrative officer or officers responsible for notifying students.

The preliminary visit to Syracuse University in early April resulted in the selection of samples of students from lists of majors in those departments where the number of seniors was over thirty. In other departments the complete list of seniors was used. Students were notified of four alternative times and six alternative places where they could have the questionnaire administered to them. Notification for most departments was by letter from the department head. These letters followed a draft prepared by the researchers. The student engineers were notified by letter from the dean of the engineering college. After students completed the questionnaires they were asked to cross their names from a list posted near the door. Additional notice by telephone was made after the first day's sessions for students in departments of the College of Liberal Arts. Follow-up was made for the engineering seniors by a general announcement over the public address system and general announcements made in classes by the faculty.

West Virginia University was the next school visited. Contact with the students was organized by the placement officer. Questionnaires were administered by the researcher in senior classes chosen by the placement officer. It was estimated that ninety percent of the seniors completed questionnaires.

At Oberlin College visits were made to the senior colloquiums which were all held on the same evening. Questionnaires were administered by the researchers during these sessions. Over ninety percent of the seniors in the fields included in this study completed questionnaires.

Purdue University presented quite a different situation. In the School of Science the dean requested that every senior complete graduation forms in his office and included the questionnaire for this study for chemistry, physics, and psychology majors. The majors in economics and political science were reached through their dean's office personally. In civil and mechanical engineering questionnaires were administered to seniors by their

professors in the classes which included most seniors. Lists were not used so the adequacy of the sample cnnot be estimated.

At Johns Hopkins University questionnaires were administered in senior classes in engineering. Science and social science students were reached through their department heads. Lists of seniors were not available for checking completeness of coverage.

Groups contacted

Visits made in late April and early May to the five colleges and universities provided us with eight hundred thirty-five completed questionnaires. Since these questionnaires form the central data of our study, detailed description of the various groups completing them is necessary for understanding and appraising our analysis.

Our attention is focussed upon the six hundred and sixty senior students describing their experiences in the recruitment process during the last weeks of their college careers. Special emphasis is placed upon describing the distribution of members of this group by: institution, field of college major, sex, age, veteran status, scholastic average, and employment experience. The group of sixty-eight graduate students and the group of one hundred and seven faculty members must be described also. However, these descriptions will be somewhat brief since relatively few generalizations concerning these groups will be made.

The distribution of seniors, graduate students, and faculty members among the five institutions is presented in Table I. The total number of seniors at each institution varies with the size of the institution. The number of seniors is adequate to test differences in attitude and other factors between institutions as will be demonstrated in Chapter V. On the other hand, too few questionnaires were obtained from graduate students and faculty members to permit comparison between schools. These groups are used only occasionally in the analysis and then for comparisons with the group of seniors.

Another step in analysis of the data will be to compare seniors on the basis of the fields of their college majors. Thus, Table II presents seniors grouped by general field: engineering, science, and social science. Sufficient cases were obtained to permit comparisons between seniors grouped into general fields. Analysis of graduate students of faculty by field of major will not be attempted due to

TABLE I

SENIORS, GRADUATE STUDENTS, AND FACULTY MEMBERS CONTACTED BY QUESTIONNAIRE, ARRANGED BY COLLEGE OR UNIVERSITY

College or University	Seniors	Graduate Students	Faculty	Total
Syracuse University	178	40	47	265
West Virginia University	98	9	10	117
Oberlin College	72	1*	15	88
Purdue University	259	1	32	292
Johns Hopkins University	53	17	3	73
Total	660	68	107	835

* Oberlin does not award graduate degrees. This student obtained a bachelor's degree in 1951 but was enrolled at the time of our visit.

TABLE II

SENIORS, GRADUATE STUDENTS, AND FACULTY MEMBERS CONTACTED BY QUESTIONNAIRE, ARRANGED BY MAJOR FIELD

Field	Seniors	Graduate Students	Faculty	Total
Engineering	318	2	33	353
Civil	138	0	12	
Mechanical	124	0	9	
Electrical	56	2	12	
Science	100	60	23	183
Chemistry	68	40	14	
Physics	32	20	9	
Social Science	162	3	25	190
Economics	65	1	9	
Political Science	36	1	8	
Psychology	61	1	8	
Dual Majors	69	3	17	89
Did not give field	11	0	9	20
Totals	660	68	107	835

the small numbers of persons in each field. Again, these groups are included in the study to provide comparison with the group of college seniors.

Almost one-half (48.2 percent) of the seniors contacted were engineers, one-fourth (24.6 percent) were in social science, and only about one-seventh (15.1 percent) were in science. Some seniors were dual majors (10.4 percent) and others did not give their fields (1.7 percent). At each of the schools visited, with the exception of Oberlin, a greater number of students were majoring in civil, mechanical, and electrical engineering than in the science and social science fields which were included. Our administration of the questionnaire reflected this condition. The science field is small partially because only two majors, chemistry and physics, were included while each of the other fields includes three majors. We sought to compensate by administering questionnaires to a greater proportion of students majoring in physics and chemistry than in the other fields; however, few students were majoring in these fields.

Although the preponderance of engineers and the sparcity of science students reflects generally the distribution of seniors in these fields, it was not our intention to control the sample carefully to accomplish this stratification. Assuming lack of sampling bias, the crucial point for our analysis is whether there are enough persons in each field: engineering, science, and social science, to test our findings for statistical significance. That this condition exists is evident from the results of such tests which are made in Chapter V.

Now let us turn to three more general characteristics of the seniors: veteran status, age, and sex. We inquired about veteran status because it is given weight in federal employment policy. This could influence student preferences for federal employment. It was thought too that those with experience in the armed services might respond differently to recruitment efforts due to the nature of this experience.

Among the seniors contacted at the five institutions, veterans made up 36.6 percent of the total. Non-veterans made up 52.9 percent of the total and 13.5 percent of the seniors did not give their status.

The age distribution of the six hundred and sixty seniors is presented in Table III. Ages range from nineteen years to forty years. Median age is 22.4 years and the group average is 22.9 years.

TABLE III

SENIORS CONTACTED BY QUESTIONNAIRE,
ARRANGED BY AGE

Age	Seniors
19 or below	4
20	36
21	182
22	124
23 - 24	141
25 - 26	49
27 - 28	25
29 - 30	18
31 - 34	12
35 - 49	1
50 or over	0
No answer	68
Total	660

Range	21 yrs.
Mean	22.9 yrs.
Median	22.4 yrs.

Each senior was asked to describe his academic standing by estimating his position relative to that of others in his class. Five categories were provided for response to the question: "What is your approximate scholastic average?" Some candor was evidenced by those who estimated their scholastic averages to be in the "third quarter" (17.0 percent), and in the "fourth quarter" (4.9 percent). The top categories were "upper 10 percent" (18.2 percent), "next 15 percent" (21.4 percent), and "second quarter" (32.3 percent). In the absence of more precise information concerning academic standing the answer to this question was used to test for relationship of such standing with employment references.

Seniors in the groups contacted were predominantly oriented towards industry as contrasted with federal or educational employment as far as the occupation of father or guardian is concerned. Approximately one-half (49.6 percent) of the seniors said their father or guardian's occupation could be classified as industrial. Only 6.5 percent said federal, and 3.9 percent educational. However, 32.6 percent could not classify father or guardian's occupation in these categories and used "other". Write-in classifications to "other" have been analyzed and found to contain no persons to add to federal or educational. Some students, 7.4 percent, did not answer this question.

One possible influence on student employment preferences is their previous employment experience. Four out of five (80.3 percent) of the seniors regard themselves as having previous employment experience of some kind. Those remaining said they have had no previous experience (16.1 percent) or failed to answer the question (3.6 percent).

Table VI presents the type of experience of the 530 seniors having previous employment experience. Experience in industry predominates. Those with industrial experience only, plus those with the combination: industrial and federal, and industrial and educational, total 89 percent. Similarly, those with some experience in federal employment total 16.8 percent, and educational only 7.9 percent.

This brief description of the group of seniors contacted provides background for description of their employment decisions and attitudes toward federal employment which is made in the following chapters.

TABLE IV

SENIORS' ESTIMATES OF THEIR OWN SCHOLASTIC AVERAGE

Scholastic Average	Seniors	
	Number	Percent
Upper 10%	120	18.2
Next 15%	141	21.4
Second Quarter	214	32.3
Third Quarter	112	17.0
Fourth Quarter	32	4.9
No Answer	41	6.2
Total	660	100.0

TABLE VI

PREVIOUS EMPLOYMENT EXPERIENCE
OF THOSE SENIORS HAVING
SUCH EXPERIENCE

Type Experience	Number	Percent
Industry	386	72.9
Federal	31	5.8
Education	22	4.1
Industry and Federal	57	10.8
Federal and Education	1	0.2
Education and Industry	29	5.5
Three fields	4	0.7
Total	530	100.0

CHAPTER III

EMPLOYMENT DECISIONS OF COLLEGE SENIORS

College visits were made in late April or early May 1952. By this time students had been subjected to intensive recruitment efforts. Placement officers regarded most of their students placed. Several persons estimated that by January or February most of the best students were placed.[1]

One placement officer had cancelled recruiters' visits previously scheduled for April.[2] The pace had been accelerated over that of previous years. At one school, six recruiters on the average visited the campus each day during the final months of the semester.[3]

Within this setting of active recruitment, it was somewhat surprising to find that only 38.2 percent of the 660 seniors said they had definitely accepted a civilian job for the period following graduation. Conversely, 60.5 percent said that they had <u>not</u> accepted definitely, and 1.4 percent did not say whether they had or had not accepted. (See Table VII.)

Of course, some students were going into the armed forces and some into graduate or professional study. When those going into the armed forces (16.4 percent) and those going into graduate study (21.4 percent) are added to those who had definitely accepted civilain jobs, the total (501) includes 76 percent of the seniors. Thus, at the time of our visits approximately one-fourth of the seniors were still undecided about what they would do after graduation.

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[1]Interviews with: Dean, College of Applied Science, Syracuse University; assistant to Placement Officer, Purdue University; and Chairman, Physics Department, Syracuse University.

[2]Interview with Director, Bureau of Appointments, Johns Hopkins University.

[3]Interview with Assistant Dean of College of Applied Science, Syracuse University.

TABLE VII

SUMMARY OF SENIORS' EMPLOYMENT DECISIONS CONCERNING CIVILIAN JOBS

Employment decision	Seniors Number	Percent
Civilian jobs		
a. Definitely accepted	252	38.2
b. Had not accepted	399	60.5
c. No answer	9	1.4
Totals	660	100.1

Students who had not yet definitely accepted civilian employment were asked if they expected to accept such employment and when. Three groups are rather well defined by their answers. (1) The first group of 107 seniors expected to accept civilian jobs in May or June 1952. (2) Forty seniors expected to accept such employment between July and September. These two groups account for 22.3 percent of all seniors and may provide a key to what will happen to the 24.7 still undecided at the time of our visits. (3) The third group expected to accept civilian jobs at a later date, i.e., by June 1953, June 1954, June 1955, or June 1956. We may assume that this group consists largely of those students who expect to go into graduate study or the military before accepting civilian employment.

Table VIII presents an overall description of the relative availability of seniors in May-June 1952. Twenty-four percent of all seniors were presumed to still be available. Fewer science students were available (twelve percent) than engineering students (twenty-four percent). Slightly more social science students (twenty-seven percent) were available for employment than the average for all seniors.

TABLE VIII

AVAILABILITY OF SENIORS FOR EMPLOYMENT IN MAY - JUNE 1952 CLASSIFIED BY COLLEGE MAJOR

College Major	Total Seniors in Sample	Definitely accepted jobs	Intend to enter military	Intend to enter graduate school	Number presumed available for employment	Percent presumed available for employment
Engineering	318	184	42	15	77	24
Science	100	27	13	48	12	12
Social science	162	22	33	63	44	27
Dual majors	69	16	16	15	22	32
No answer	11	3	3	1	4	36
TOTAL	660	252	107	142	159	24

Type of employment preferred

One key to the analysis of student attitudes toward employment is provided by the behavior of students in choosing one type of employment in preference to others. Some students had definitely accepted employment. Others indicated the type which they expected to accept. Even those going into the armed forces or into graduate or professional school were asked to indicate the type of civilian employment which they expected to accept in the future. Students' response in given in Table IX.

Those who had definitely accepted jobs had participated in the recruitment process and had translated their attitudes and expectancies into a definite judgement regarding industrial, federal, educational, and other types of employment. Three out of four (77.8 percent) chose jobs in industry. Only one out of twenty (5.2 percent) chose federal employment. One out of twenty (4.8 percent) chose educational employment. One out of ten chose employment which could not be classified under these headings.

One half (50.6 percent) of the students without jobs expected to choose industrial employment eventually. One out of ten expected to choose a federal job, and about as many (7.8 percent) expected to choose a job in education. Again one out of ten chose employment which could not be classifed under these headings.

Twenty-two percent of those who had not definitely accepted jobs failed to answer the question concerning the type of civilian employment they expected to accept. Only 2.4 percent of those with jobs failed to answer. This difference reflects the uncertain situations which some students faced.

A question can be raised but not resolved in this study concerning the adequacy of the distribution of seniors among employment areas. If all who expect to accept federal jobs are added to those who actually have accepted federal jobs the total of 53 is 8.0 percent of the 660 seniors. Similarly only 43 or 6.5 percent would be channeled into educational employment. On the other hand, a total of 396 or 60.3 percent would accept industrail jobs.

Let us focus attention upon those seniors who had accepted civilain jobs definitely. Preference for particular types of employment varies somewhat among

TABLE IX

EMPLOYMENT PREFERENCES OF SENIORS WHO HAD DEFINITELY ACCEPTED CIVILIAN JOBS OR EXPECTED TO ACCEPT CIVILIAN JOBS IN THE NEAR FUTURE OR AFTER GRADUATE STUDY OR MILITARY SERVICE

Field of employment	Definitely accepted		Expected to accept	
	Number	Percent	Number	Percent
Industry	196	77.8	202	50.6
Federal	13	5.2	40	10.0
Education	12	4.8	31	7.8
Other	25	9.9	38	9.5
No answer	6	2.4	88	22.1
TOTAL	252	100.1	399	100.0

colleges and among majors. Table X presents the data for colleges and Table XI for field of college major.

For example, only 28.6 pecent of the Oberlin seniors who had accepted jobs had chosen industry. This is far below the 77.8 percent figure for industry among all seniors who had accepted jobs. On the other hand, seniors at the other colleges chose industrial employment in about the same proportion as the whole group.

Preference for federal employment among seniors who had accepted employment varied from 21.4 percent at Oberlin down to 0.0 percent at West Virginia University. The total number of such seniors choosing civilian jobs in the federal government was small, only 13, so further comparisons among

TABLE X

EMPLOYMENT PREFERENCES OF SENIORS
WHO HAD DEFINITELY ACCEPTED CIVILIAN JOBS:
CLASSIFIED BY COLLEGE

Field of employment	Syracuse		West Va.		Oberlin		Purdue		Johns Hop.	
	N	%	N	%	N	%	N	%	N	%
Industry	35	76	37	82	4	29	92	80	28	88
Federal	6	13	0	0	3	21	2	2	2	6
Education	1	2	3	7	5	36	3	3	0	0
Other	4	9	5	11	2	14	12	10	2	6
No answer	0	0	0	0	0	0	6	5	0	0
TOTAL	46	100	45	100	14	100	115	100	32	100

TABLE XI

EMPLOYMENT PREFERENCES OF SENIORS
WHO HAD DEFINITELY ACCEPTED CIVILIAN JOBS:
CLASSIFIED BY FIELD OF MAJOR

Field of employment	Engineering		Science		Social Science	
	N	%	N	%	N	%
Industry	157	85.4	17	63.0	10	45.5
Federal	9	4.9	1	3.7	3	13.6
Education	2	1.1	6	22.2	2	9.1
Other	15	8.1	1	3.7	6	27.3
No answer	1	0.5	2	7.4	1	4.5
TOTAL	184	100.0	27	100.0	22	100.0

colleges are tenuous.

One rather unique observation may be made about the choice of educational employment. Approximately one out of every three Oberlin students with jobs had chosen education. The other colleges are much closer to the 4.8 percent for the whole group of seniors.

When student preferences are analyzed by field of college major important differences are brought to light. Engineering majors choose industrial jobs in greater proportion (85.4 percent) than all seniors taken together (77.8 percent). A smaller percentage (63.0) of the science majors had accepted industrial employment. Only 45.5 percent of the social science majors were placed in industry at the time of our visits.

Time of acceptance

Definite acceptance of employment by the college student represents a terminus in the recruitment process. We have built a description of the time students made their job decisions or expected to make their job decisions. A summary of student response is presented in Table XII.

April was the month of more frequent acceptance for those students who had definitely accepted employment at the time of our visits. Approximately forty-three percent of those definitely accepting jobs accepted during April. Sixty-six percent of the seniors who had definitely accepted jobs accepted in April and May combined. Seventy-seven percent accepted in March, April, or May.

Since visits to the colleges were made in late April and early May the time of definite acceptance provides a distorted view. Some seniors had not yet accepted definitely. They had not yet graduated and presumably were still undecided. Others were entering the armed services or graduate school and would not definitely accept civilian employment for a year or more. In order to obtain more accurate descriptions, those seniors who had not yet definitely accepted employment were asked to estimate the month in which they expected to accept civilian employment. Twenty-seven percent of these seniors expected to accept in May or June. Ten percent expected to accept during July, August, or September, following graduation and the rest in the years following. Some estimates, of definite acceptance of civilian employment were for 1956.

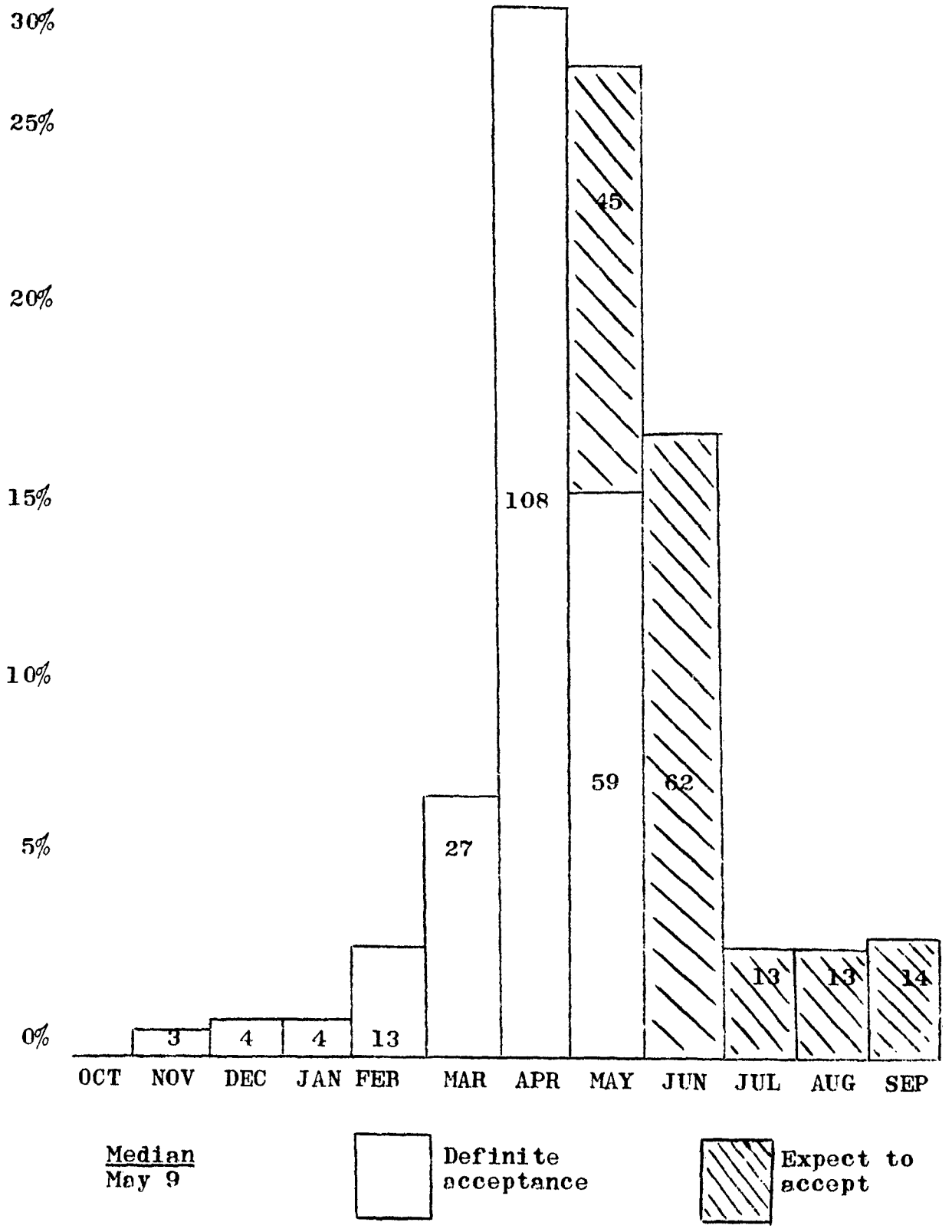
TABLE XII

TIME AT WHICH SENIORS DEFINITELY ACCEPTED OR EXPECTED TO ACCEPT EMPLOYMENT

Time of job decision	Definitely accepted		Expected to accept	
	Number	Percent	Number	Percent
Before 1951	9	3.6		
1951 January - August	4	1.6		
September				
October				
November	3	1.2		
December	4	1.6		
1952 January	4	1.6		
February	13	5.3		
March	27	10.7		
April	108	42.9		
May	59	23.2	45	11.3
June			62	15.5
July			13	3.3
August			13	3.3
September			14	3.5
October 52 - June 53			60	15.0
July 53 - June 54			28	7.0
July 54 - June 55			25	6.3
July 55 - June 56			12	3.0
July 56 - and after			2	0.5
No answer	21	8.3	125	31.3
TOTAL	252	100.0	399	100.0

Figure 2

PATTERN OF JOB DECISIONS OF THE 365 SENIORS DEFINITELY ACCEPTING OR EXPECTING TO ACCEPT CIVILIAN EMPLOYMENT FROM OCTOBER 1951 TO OCTOBER 1952



In order to provide a more readily understandable description of the time of student job decision, we have combined definite acceptance and estimates of acceptance for a twelve month period, October 1951 to October 1952. Figure 2. depicts in summary the time of decision for the 365 students definitely accepting or expecting to accept civilian employment during this period.

The modal month is April with 29.6 percent, but May is very close with 28.5 percent. Taken together, these months account for about 58 percent of the job decisions. If June is added the total decisions is increased to 76 percent of all seniors. Some students had accepted positions as early as the fall semester. The recruitment process therefore, is a year-round function.

CHAPTER IV

ATTITUDES TOWARD INDUSTRIAL AND FEDERAL EMPLOYMENT

Understanding of the recruitment process should be based upon description and analysis of both the behavior and attitudes of participants in the process. The previous chapter was concerned with behavior related to the process. In this chapter attention is focused upon the attitudes of seniors, graduate students, and faculty members concerning industrial and federal employment. The research plan of this approach was described in Chapter II.

During campus visits there was opportunity through general observation and interviews to make judgements about attitudes of students and other participants in the recruitment process. Such experience was richly productive of illustrative cases and also served as a valuable check of other findings. However, the systematic description of attitude in this report is based upon response to an anonymous questionnaire which was administered to groups. (See Appendix C for a sample of the questionnaire.)

Following procedures described in Chapter II, thirty-eight statements comparing federal and industrial employment were constructed from the results of an extensive pilot study conducted by Bush. Five adjective categories were provided following each statement so that respondents could indicate intensity of favor or disfavor of their attitudes.

This scoring schedule technique for assessing attitudes made it possible to measure intensity of student favor on the content of each attitude statement and also to average response on all thirty-eight to obtain a single attitude score. Average scores of individuals were grouped and averaged again to obtain measures of attitude for colleges, field of college major, and other collectivities. Description and analysis of attitudes are derived from these average scores for the thirty-eight statements, the scores for individual statements, and responses to other items in the questionnaire.

Results of these procedures are presented under five major headings:

(1) Preference for industrial employment, in which attitude scores for seniors are described by comparing them with scores of faculty members and graduate students and by examining seniors' scores when grouped by institution and by field of college major.

(2) Validity of attitude scale tested by job decision.

(3) Factors influencing attitude in which previous employment experience, summer training programs, occupation of father or guardian, scholastic standing, veteran status, and sex are examined for relationship with attitude toward employment.

(4) Attitude content, in which response is analyzed by specific statements and by statements grouped into areas of similar content.

(5) Sources of information, in which seniors' evaluations of such sources are compared for industrial and federal jobs.

Preference for industrial employment

Average attitude scores for individuals or groups have as their frame of reference values from zero to four. Zero on this continuum represents strong favor for industrial employment, two represents neutrality or don't know, and four represents strong favor for federal employment.[1]

Seniors as a group favor industrial employment rather than federal employment. The group mean of 1.65 on the zero to four scale is located on the industrial side of neutrality. Individual scores ranged from 0.6 units to 2.9 units. All seniors below the mean and those within one standard deviation distance above the mean favored industrial employment. However, thirteen precent of the seniors were more favorable to federal employment than industrial: Their scores were above 2.0 units. (See Tables XIII and XIV.)

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[1]For fuller discussion of the scale of values see Chapter II.

TABLE XIII

STATISTICAL DESCRIPTION OF DISTRIBUTIONS
OF ATTITUDE SCORES

Statistical Measures	Seniors	Graduates	Faculty
Total number	660	68	107
Mean	1.65	1.74	1.72
Median	1.64	1.70	1.74
Range	2.4	1.3	1.8
Standard deviation	0.40	0.32	0.39
Standard error of mean	0.016	0.039	0.038

By way of contrast, graduate students averaged 1.74 units and faculty members 1.72 units. The difference between each of these means and the mean score for Seniors (1.65 units) is statistically significant.[2] Thus, group averages for seniors, graduate students, and faculty members all indicate a greater degree of favor toward industrial employment than toward federal

[2] Using a t-test the difference between seniors and graduate students is significant at the .02 level of confidence. The difference between seniors' and faculty members' attitude scores is significant at the .05 level of confidence. See Joy P. Guilford, Fundamental Statistics of Psychology and Education, 2nd Ed., (New York: McGraw-Hill Book Co., 1950), page 209.

employment when the units of the scale are taken at their *a priori* value.

Another basis for gaining perspective concerning these averages is provided by establishing behavioral landmarks on the continuum. Two groups of seniors were chosen for this purpose. Each group had translated attitudes toward employment into definite preferences.

First, those who had definitely accepted federal jobs and those expecting to accept federal jobs were grouped together. Their attitude scores averaged 2.07 units. Similarly, those definitely accepting or expecting to accept industrial jobs were grouped. Their attitude scores averaged 1.54 units. The difference between group averages is statistically significant at the .001 level. These averages provide two landmark scores for interpreting the scores of seniors, graduate students, and faculty members.

SCALE LOCATION OF AVERAGE SCORES:
SENIORS, GRADUATE STUDENTS, AND FACULTY

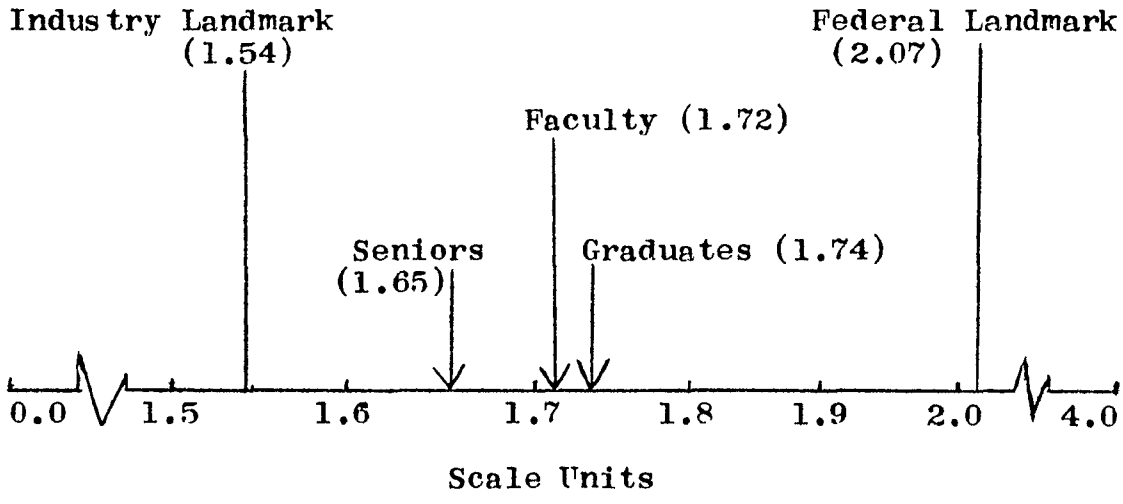

Figure 3.

TABLE XIV

FREQUENCY DISTRIBUTION AND AVERAGE ATTITUDE SCORES OF SENIORS, GRADUATE STUDENTS, AND FACULTY TOWARD FEDERAL EMPLOYMENT AND INDUSTRIAL EMPLOYMENT

Attitude scores		Number of seniors	Number of graduate students	Number of faculty
Strong favor federal employment	4.0			
Tend to favor federal employment	3.0			
	2.9	3		
	2.8	2		
	2.7	2		
	2.6	2		1
	2.5	4		0
	2.4	9	2	3
	2.3	20	3	4
	2.2	19	4	9
	2.1	28	4	7
Neutral or don't know	2.0	40	4	8
	1.9	43	6	9
	1.8	65	5	11
	1.7	80	13	9
	1.6	86	8	9
	1.5	53	8	9
	1.4	65	4	10
	1.3	42	4	8
	1.2	37	2	1
	1.1	28	1	3
Tend to favor industrial employ.	1.0	10		2
	0.9	10		3
	0.8	5		1
	0.7	3		
	0.6	2		
	0.5	2		
Strong favor industrial employ.	0.0			
TOTALS		660	68	107
Mean		1.65	1.74	1.72

Inspection of Figure 3 shows that neither seniors, graduate students, nor faculty are as favorable to industrial or federal employment as those accepting or expecting to accept jobs in either of these fields. However, all three groups are located closer to the average score for those preferring industrial employment than federal employment.

Effect of field of major and college upon preference[3]

A wide variation in attitude toward employment was found among seniors when grouped by field of college major. The distributions of individual average scores by majors are presented in Table XV. When these group scores are compared with the two landmark groups used above, the nature of this variation can be described. For example, seniors majoring in mechanical engineering are more favorable to industrial employment than those students from all majors who have definitely accepted or expect to accept industrial employment. On the other hand, seniors majoring in political science are almost identical in score with students from all majors choosing federal employment.

Other majors range between these extreme groups. In rank order from favor to industry towards favor to government the majors are: mechanical engineering, civil and electrical engineering (equal scores), chemistry, economics, physics, psychology, and political science.

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[3]See Appendix G for analysis of one major field, chemistry.

TABLE XV

FREQUENCY DISTRIBUTION OF AVERAGE ATTITUDE SCORES FOR SENIORS ARRANGED BY COLLEGE MAJOR

Attitude scores	Mech. eng.	Civ. eng.	Elec. eng.	Chem.	Econ.	Physics	Psych.	Pol. sci.
Strong favor-4.0 federal employment ---								
Tend favor---3.0								
federal 2.9								2
employment 2.8					1			1
2.7			1	1	0			0
2.6			0	0	1		1	0
2.5		1	0	1	2		0	0
2.4		0	0	2	1		1	3
2.3		2	1	2	5		6	4
2.2	1	1	3	1	2	1	3	5
2.1	4	5	0	1	1	4	5	5
Neutral or---2.0	5	7	3	5	5	3	6	2
don't know 1.9	2	12	3	3	6	7	5	1
1.8	15	19	6	8	2	2	5	5
1.7	14	18	6	8	10	1	5	4
1.6	13	19	9	11	11	3	8	3
1.5	10	10	6	7	6	4	3	0
1.4	15	16	7	5	3	2	6	0
1.3	14	11	2	3	1	1	4	0
1.2	12	6	4	4	1	3	1	0
1.1	15	4	3	1	1	0	1	0
Tend favor---1.0	2	2	0	1	1	0	1	0
industrial 0.9	1	2	0	3	2	0		0
employment 0.8	0	3	0	0	1	0		1
0.7	1		1	0	1	0		
0.6			1	0	0	1		
0.5				1	1			

Strong favor-0.0 industrial employment								
Totals	124	138	56	68	65	32	61	36
Mean	1.49	1.60	1.60	1.64	1.68	1.70	1.79	2.05

SCALE LOCATION OF SENIORS' AVERAGES
BY FIELD OF MAJOR

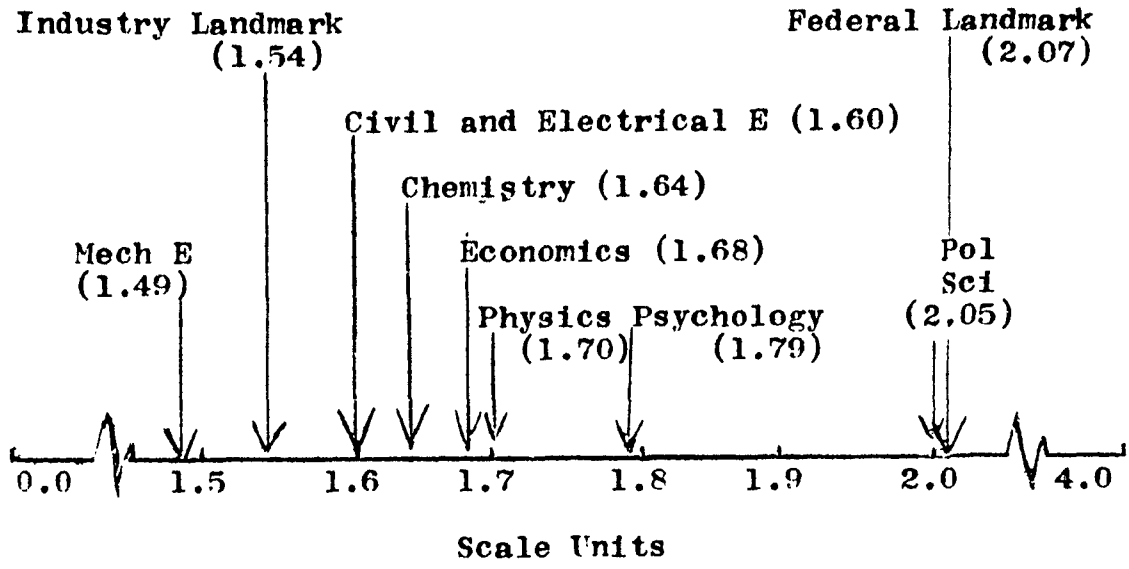

Figure 4.

Wide variation was also found among seniors when grouped by college. These data are presented in Table XVI. Seniors at three schools were just about as favorable toward industrial employment as the group of seniors accepting or expecting to accept such employment. They are Purdue (1.53 units), West Virginia (1.55) and Johns Hopkins (1.57). Seniors at the two remaining schools were significantly less favorable toward industrial employment: Syracuse (1.79) and Oberlin (1.83).

Description of group averages by field of college major and by college raises the question of which factor affects attitude more. It is possible that the differences among schools are affected by the distribution of seniors at these schools among the various fields.

An iterative method was employed to adjust college scores for the effects of majors and majors' scores for the effects of colleges. Results are presented in Table XVII.

TABLE XVI

FREQUENCY DISTRIBUTION OF AVERAGE ATTITUDE SCORES OF SENIORS ARRANGED BY INSTITUTION

Attitude scores		Purdue University	West Virginia University	Johns Hopkins University	Syracuse University	Oberlin College
Strong favor-federal employment ---	4.0					
Tend to favor-federal employment	3.0					
	2.9	1			2	
	2.8	0			0	2
	2.7	1			1	0
	2.6	1			1	0
	2.5	0	1		1	2
	2.4	0	3		5	1
	2.3	4	0		12	4
	2.2	5	1	1	7	5
	2.1	9	3	1	11	4
Neutral or--- don't know	2.0	12	6	3	11	8
	1.9	8	7	2	19	7
	1.8	21	4	8	27	5
	1.7	31	12	8	18	11
	1.6	33	11	8	26	8
	1.5	23	7	7	9	7
	1.4	32	15	4	10	4
	1.3	20	7	3	11	1
	1.2	20	10	3	3	1
	1.1	18	3	4	3	0
Tend to favor-industrial employment	1.0	6	3	0	0	1
	0.9	8	1	0	0	1
	0.8	3	2	0	0	
	0.7	2	1	0	0	
	0.6	0	1	0	1	
	0.5	1		1		

Strong favor--industrial employment	0.0					
Totals		259	98	53	178	72
Mean		1.53	1.55	1.57	1.79	1.83

TABLE XVII

ATTITUDE SCORES FOR SENIORS: (1) CLASSIFIED BY FIELD OF MAJOR AND ADJUSTED FOR THE EFFECT OF VARIATION AMONG COLLEGES; AND (2) BY COLLEGE AND ADUSTED FOR THE EFFECT OF VARIATION AMONG FIELDS.

	Number of seniors	Unadjusted mean score	Adjusted mean score
(1) Field of major			
Engineering	318	1.56	1.58
Science	100	1.66	1.66
Social science	162	1.82	1.79
TOTAL	580	1.65	1.65
(2) College			
Purdue	218	1.53	1.54
West Virginia	78	1.55	1.59
Johns Hopkins	52	1.57	1.60
Oberlin	69	1.84	1.74
Syracuse	163	1.80	1.80
TOTAL	580	1.65	1.65

In order to simplify this test, the eight college majors were assigned to three groups: engineering, science, and social science. When group means for these fields and for individual colleges were adjusted, an F-test indicated that both factors were highly significant.[3] Thus, variations in average attitude scores among students in the three fields are statistically significant. Similarly, average attitude scores at the five colleges are significantly different. Each factor accounts for part of the variation in attitudes. Taken together they explain most of the variation discovered. These generalizations can be checked by reference to Appendix F where the method is described.

Validity of attitude scale tested by job decision

In studying college seniors as participants in federal and industrial recruitment processes, our focus of attention was upon a single attitude variable. This variable extends from strong favor for industrial employment (0 units), through neutrality (2 units), to strong favor for federal employment (4 units). Each statement used to measure this attitude variable posed a comparison between the two types of employment. Our central assumption was that such participant's attitude score on this variable would influence his behavior in making his employment decision. Thus, we anticipated attitude scores on this attitude variable would facilitate our analysis of student behavior in recruitment.

Student response to questions concerning his own job decision and employment preference provides a description of his behavior in the recruitment process. The general pattern of this behavior was described in Chapter IV.

One validity test for attitude scores was made by grouping students according to their employment preference and examining attitude scores for these groups to see if the attitude score was consistent with employment preference. Some of the students had definitely accepted a particular type of employment. In varying degree each had translated his attitude toward employment into action.

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[3]Guilford, op. cit., pp.232, 240, and 252. This source provides a general description of F-tests or F-ratios. See Appendix F for values in above use of the test.

Results of this test are presented in Table XVIII. Those students preferring industrial employment had an average attitude score of 1.54 units; those preferring federal employment 2.07 units; educational employment 1.76 units; and other types of employment 1.76. Variation among these group averages proved to be significant at the .001 level on the basis of an F-test. The averages for those preferring industrial and federal employment were significantly different at the same level.

The group averages fall into a pattern conforming with our general expectancies about student attitudes. Those seniors preferring industrial employment have an average score more favorable to such employment than any other group. Those preferring federal employment have an average score more favorable to such employment than any other group. Those preferring educational and other types are located between the two extreme groups on the attitude variable.

In lieu of any other external measure these findings provide evidence of the validity of this technique for scoring attitudes toward industrial as compared with federal employment.

Throughout this study we have relied upon the average scores of the group preferring industrial employment and the group preferring federal employment to provide behavioral landmarks on the a priori scale. The common location of both groups having preferences for employment other than federal or industrial suggests a neutral landmark. These landmark positions provide us with a frame of reference based upon the relationship between student's attitudes and their choice of fields of employment.

Another behavioral test for the average scores is provided by analysis of two other groupings of seniors. Those who have definitely accepted specific jobs averaged 1.54 units. Those who had not accepted at the time of our visits averaged 1.71 units.

These averages check with the findings presented in Table IX of Chapter III. Approximately 78 percent of those who had definitely accepted employment chose industrial employment, while only approximately 50 percent of those who had not definitely accepted employment chose industrial employment. Conversely, while about 5 percent of those who had definitely accepted chose federal, ten percent of those who had not yet accepted expected to choose federal employment.

TABLE XVIII

RELATIONSHIP OF ATTITUDE SCORES OF SENIORS
TO
EMPLOYMENT PREFERENCE

Employment preference*	Number of seniors	Average attitude scores
Industrial	398	1.54
Federal	53	2.07
Educational	43	1.76
Other	63	1.76
No response	103	1.69
Totals	660	1.65

*Includes seniors who had accepted or expected to accept employment in a field.

These two tests confirm the validity of the technique employed for measuring attitude toward industrial as compared with federal employment. They also support the assumption that this attitude variable is consistently related to student behavior in the recruitment process, at least as far as choice of employment is concerned.

Factors influencing attitude

As a result of the pilot study, several factors were selected to test for relationship with attitude scores. Previous employment experience, participation in a summer training program, or the occupational background of father or guardian could be expected to affect a student's attitude toward employment. One of these factors, occupation of father, is beyond direct control of recruiting organizations but each of these factors has connotation for recruitment policy. Scholastic average, veteran status, and sex are also examined for their relationship with attitude scores.

Previous employment experience

Since previous employment experience was described in detail in Chapter III, it will suffice here to note that most seniors had experience in industry, a large group had no experience at all, but enough had experience in federal employment to permit comparison. Mean scores for the various experience groups are presented in Table XIX.

A general statistical analysis of relationship included an F-test for the 631 remaining seniors for which means were computed. The test showed significance at the .01 level and justified the examination of differences among averages.

Seniors having previous employment experience in industry had an average attitude score of 1.61 units. Those with federal experience averaged 1.89 units. The difference between these means was given a t-test and found statistically significant at the .001 level, sometimes called "very significant". Thus it appears that a consistent relationship exists. Previous employment in a field tends to be related to attitudes favorable to that field.

TABLE XIX

RELATIONSHIP OF ATTITUDE SCORES OF SENIORS
TO
PREVIOUS EMPLOYMENT EXPERIENCE

(1) Employment experience	Number of seniors	Mean score
No experience	106	1.70
Industrial	386	1.61
Federal	31	1.89
Education	22	1.71
Industrial & federal	57	1.62
Federal & educational	1	--*
Industrial & educational	29	1.68
Three fields	4	--*
No response	24	--*
Totals	660	1.64

*Scores for individuals in these groups were included in total mean score but group scores were not computed.

It should be noted that neither mean score is as favorable toward the field of employment as the mean of students accepting or expecting to accept jobs in that field. For industrial the average score was 1.54 and for government it was 2.07. Thus previous experience in a field does not guarantee as high a degree of favor for that field as held by seniors preferring to accept jobs in that field after graduation. But previous experience does result in general favor for the respective field.

For the remaining experience groups, those with no experience average 1.70 units, those with educational experience average 1.71, and those with both industrial and educational experience average 1.68. However, those with both industrial and federal experience average 1.62. This average is not significantly different from the average for those with industrial experience alone, 1.61 units. But it is significantly different from the average score of these seniors with federal experience alone, 1.89 units. Thus, seniors having experience in both fields under investigation express a strong favor for industrial employment.

Summer training programs

In some cases the senior's employment experience was derived through summer training programs. One hundred and eleven students had such experience in industrial employment and twenty-two in federal. The average scores for these respective groups are 1.62 units and 1.86 units. The difference between these group averages is statistically significant at the .02 level.

Thus we can conclude that summer training programs either attract students with attitudes oriented about the field in which such experience is chosen, or that the experience gained affects student attitudes favorably. Further analysis of the effect of such programs upon student attitudes toward employment seems warrented. A before-and-after study emplying the scoring schedule would be relatively simple to design and administer.

Occupation of father or guardian

The senior's attidue toward industrial and federal employment may be developed in the family. Analysis of this factor is based upon a grouping of seniors by their own classification of their "father's or guardian's" occupations. Fifty percent of the seniors classified

their parent's occupations as industrial and 6.5 percent federal. Four percent of the seniors had family occupational backgrounds which they classified as educational. The remaining students used other classifications (32.6 percent) or failed to answer the question (7.4 percent).

Seniors with industrial family backgrounds had an average attitude score of 1.61 units. Those with federal backgrounds averaged 1.82 units. The difference is statistically significant at the .001 level. These averages are located on the attitude scale at positions relatively near the landmarks established by those seniors accepting or expecting to accept employment in these respective fields: 1.54 for industry and 2.07 for federal. Each group lies in toward neutrality from these landmarks. Seniors with family backgrounds oriented about educational employment average 1.75 units.

Those with "other" family backgrounds average 1.64 units. This score lies closer to the group with industrial family bacgrounds than federal illustrating again the general "industrial" orientation of most seniors included in the study.

Scholastic standing

One hypothesis concerning student employment preferences which was suggested in interviews with faculty members during the pilot study and the current study concerns student ability. Occasionally, it was held that only the less able students would prefer federal employment over industrial employment. To test this hypothesis each student was asked to estimate his standing relative to that of other members of his class. These estimates were presented in Chapter II. (See Table IV.)

Average attitude scores were computed for seniors grouped by scholastic standing. The upper ten percent averaged 1.60 units; the next fifteen percent 1.64 units; second quartile, 1.66 units, third quartile, 1.64 units; and fourth quartile 1.71 units. An F-test of the relationship between average attitude score and scholastic standing indicates that the variation is not statistically significant. Thus, this test of the hypothesis presented in the interviews does not support the hypothesis. Employment preferences are not clearly related to scholastic standing.

Veteran status

In some interviews it was suggested that veterans would not be as likely to prefer federal employment as other students. Two hundred and twenty-two seniors were veterans. Their average attitude score was 1.66 units. Three hundred and forty-nine seniors were not veterans. Their average score was 1.62 units A t-test indicates that the difference between these average scores is not statistically significant. Thus veterans and non-veterans differ but not significantly in their attitudes toward federal as compared with industrial employment.

Sex

Most of the seniors were males, 88.4 percent. Some did not answer the question concerning their sex, 2.4 percent. Only 9.2 percent were females. Men averaged 1.63 units and women 1.82 units. Their averages were significantly different at the .001 level.

Attitude content

One value of the scoring schedule technique for measuring attitude is that each individual statement provides a basis for analysis of attitude content. Each respondent indicates degree of favor or disfavor to the content of a question by choosing an appropriate adjective. Because of this characteristic of the schedule, response to each statement can be presented independently to pin-point analysis on specific factors of employment. The average scores which have been the basis of our analysis so far are derived from the score on each statement.

Average scores for each of the thirty-eight statements range from 0.74 for statement number twenty-four to 2.71 for statement number nineteen. Statement scores are more favorable to industry than 2.0 units in twenty-six cases, and more favorable to federal employment than 2.0 units in eleven cases. One statement averaged 2.0 units.

Our first examination of the content of student attitude prferences for these fields of employment is based upon a listing of the content of the ten statements

toward which each field was held in greatest favor. Results are presented in Tables XX and XXI. The specific content of these statements represents student evaluation of contrasting advantages of industrial and federal employment.[4]

Pay for higher level positions was regarded as the greatest advantage of industrial employment. Seniors believed that students with the greatest ability were more likely to enter industry. Industrial employment was regarded to provide greater incentive for the employee.

Seniors felt that their fellow students were more inclined to work for industry than for the federal government, thus evidencing a general preference for such work. Management efficiency both in the field of the seniors' training and in general were regarded to be greater in industry.

Students felt that the employee works harder in industry and were attracted by this characteristic. Professional development was regarded to be more likely. And finally, it was felt immediate supervisors would be more competent.

The greatest degree of favor for federal employment was evidenced in response to the statement concerning the likelihood of the individual working "under pressure" less frequently than in industry. (See Table XXI.) Experience in federal employment was regarded to be a good recommendation for future work in industry.

Liberal vacation pay policy, sick leave policy, and retirement were next in rank as advantages of federal employment. Job security was next in importance.

It was felt that federal equipment for technical work was an advantage. Also that there was less likelihood of discrimination against the individual. Finally the geographic location of positions was regarded favorably as was the permanence of federal employment.

It is important to point out that the intensity of favor toward government on these characteristics was not as great as the intensity of favor toward the ten statements most favorable to industry. (Table XX).

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[4]Scores of seniors, faculty members, and graduate students on each of the thirty-eight statements are presented in Appendix H.

TABLE XX

TEN STATEMENTS UPON WHICH SENIORS' RESPONSE WAS MOST FAVORABLE TOWARD INDUSTRIAL EMPLOYMENT

Statement number	Content of statement	Average score for all seniors*
24	pay for higher level positions	0.74
38	students with greatest ability more likely to enter	0.88
21	incentive for employee to work	0.94
1	students more inclined to work for industry	0.95
13	general management efficiency	1.04
23	pay dependent upon ability	1.07
12	management efficiency in my field	1.09
20	employee works harder	1.11
3	general professional development	1.13
14	competent immediate supervisors	1.19

* The lower the score, the more favorable to industry.

TABLE XXI

TEN STATEMENTS UPON WHICH SENIORS' RESPONSE WAS MOST FAVORABLE TOWARD FEDERAL EMPLOYMENT

Statement number	Content of statement	Average score for all seniors*
19	individual works "under pressure" less frequently	2.71
5	experience good recommendation for future work in industry	2.56
29	liberal vacation policy	2.56
30	liberal sick leave policy	2.50
31	beneficial retirement system	2.36
7	job security	2.29
16	equipment for technical work	2.24
36	discrimination against individual less likely	2.24
9	geographic location of positions	2.19
2	employment more likely to be permanent	2.12

* The higher the score, the more favorable to federal employment.

Analytical scores

Content of student attitudes toward employment has been described by contrasting ten statements upon which response was most favorable to federal employment with ten most favorable to industrial employment. The scoring schedule technique also provides another basis for describing attitude content. Analytical scores can be obtained by grouping statements into general categories based upon similarityof content. For example, five statements involve comparisons in pay between federal and industrial jobs. The individual's scores on these five statements can be averaged to provide analysis of his attitude toward pay. Similarly, scores of all seniors on these five statements can be averaged to obtain analysis of this group's attitude toward pay. Following the latter procedure seven content areas have been established and arranged in rank order of decreasing favor for federal employment. Results are presented in Table XXII.

These areas correspond closely to classifications of response developed inductively in the pilot study. Student response to free answer or open-ended questions was classified systematically in that study. Areas where response was most frequent were chosen to establish the content of statements for the current study. Each of the thirty-eight statements of the current study represents a paraphrasing of students' expressions of attitude in these content areas discovered in the pilot study. Thus, the content areas now under examination were derived inductively from student comment rather than being injected arbitrarily into the study by researchers.

Seniors evidence greater favor toward federal than toward industrial employment in two areas. Benefits, including vacation policy, sick leave policy, and retirement, rank first. Job security ranks second. Both areas average above 2.0, neutrality on the scale.

By way of contrast, seniors preference for industrial as compared with federal employment is clearly demonstrated by response to the three statements concerning general employment preference. The average score for this area indicates the strongest favor for industry of any of the content areas. More specific areas, pay and promotion, ranked second and third. Pay includes five statements ranging from starting pay to long range financial return. Promotion included only two statements, one concerning rate of advancement, the other the effect of merit on promotion.

TABLE XXII

RESPONSE OF SENIORS TO THIRTY-EIGHT STATEMENTS GROUPED BY CONTENT AREA

Area	Statements included in area are numbers:	Average score for seniors *	Average score for faculty *
Benefits	29, 30, and 31	2.47	2.39
Job security	2 and 7	2.21	2.32
Recruitment	9, 10, 11, and 37	1.80	1.74
Professional development	3, 4, 5, 6, and 8	1.73	1.95
Working conditions	12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 33, 34, 35, and 36	1.62	1.70
Promotion	27 and 28	1.38	1.38
Pay	22, 23, 24, 25, and 26	1.22	1.25
General preference	1, 32, and 38	1.05	1.32

* Scores above 2.0 indicate favor toward federal employment, those below 2.0 indicate favor toward industrial employment.

Fourteen statements concerning working conditions averaged 1.62 units. This scale score ranks fourth in favor of industry. However four of the individual statements averaged scores greater than 2.0, evidencing favor for federal employment. They concern: working "under pressure" less frequently in federal employment, better equipment for technical work, less discrimination against the individual, and less need for "pull". Three others are below but very close to neutrality, 2.0 units. Two of these concern working conditions in general; the other, the effect of one's personal beliefs upon his chance of obtaining a job.

Seniors were more favorable toward industrial employment on the remaining seven statements concerning working conditions. Incentive to work ranked highest in favor of industry. Management efficiency, competence of immediate supervisors, lack of "red tape", recognition of initiative and difficulty of the work all were regarded as favorable to industry.

It should be noted that seniors averaged 1.95 and 1.92 on statements number fifteen and thirty-three respectively. Both statements concerned working conditions in general. In one, the term "federal government" was used. The other was identical except for the use of "federal civil service" in place of "federal government." The similarity in response indicates no differentiation between terms. Response on these two questions indicates that in general students do not regard federal working conditions with extreme favor or disfavor. When specific aspects of working conditions are presented some are regarded favorably to government and some favorably to industry as described above.

Another important content area, professional development, included five statements averaging 1.75 units. Questionnaire statement number three presented a direct comparison between opportunities for professional development in federal and industrial employment. Response to this statement favored industry distinctly, 1.13 units. Similarly, industrial employment was believed to provide more diversified experience, and better opportunity for additional training in the student's professional field. These two statements averaged 1.50 and 1.55 respectively. These scores are considerably higher than that of statement number three.

Opportunity to develop professionally by doing research work in the students' field brought a response

of 1.92, very near neutrality. Experience gained in federal employment was regarded a good recommendation for future work in industry. This is evidenced by the average score of 2.56 to statement number five.

The area referred to as recruitment includes four statements. One general statement, number thirty-seven, concerns employment procedure: "It takes less effort to obtain a job with the federal government than to obtain a job with industry." The three remaining statements in this area concern geographic location of positions and the variety of positions. Response to these statements averaged 1.80 units, favorable to industry.

Table XXII also summarizes faculty response in the areas just mentioned. Thus, we can compare the content of student and faculty attitude. It will be recalled that the 107 faculty members had an average attitude score of 1.72 compared with the senior's 1.65. The difference between averages was statistically significant, so analysis of content is warranted to discover the nature of this difference.

Benefits and job security rank among faculty as they did among students, the areas of greatest favor for federal employment. The first difference in rank order is professional development. This area averaged 1.73 among seniors but 1.95 among faculty. Thus faculty members regard the possibility of professional development in federal employment with greater favor than the seniors.

At the other extreme, strong favor for industrial employment, the faculty evidenced less general preference towards industry, 1.32 units compared with the seniors' 1.05 units. Pay and promotion averaged approximately the same values for both faculty and seniors. Faculty members were slightly more favorable towards federal employment regarding working conditions and slightly less favorable concerning recruitment.

Sources of information

Another approach to further understanding of college seniors' attitudes toward employment is to examine their sources of information concerning employment opportunities. The communication process by which students learn about specific employment opportunities is crucial to recruitment. In a sense, description of students' sources of information reflects the impact of recruitment efforts. (See Table XXIII).

TABLE XXIII

SENIORS' SOURCES OF INFORMATION
CONCERNING JOB OPPORTUNITIES

Source	Federal job opportunities*	Industrial job opportunities*
Placement office	20.5	24.4
Newspapers, radio, and television	19.4	7.1
Representative who visited campus	13.5	30.6
Faculty members	10.5	8.0
Other students	8.2	4.7
Family	6.8	8.5
Other sources and no response	21.2	16.7

* Numbers indicate percentage of seniors regarding source to be the most important.

Seniors' response to two questions concerning their sources of information about employment provide data for description of the communication process. They were asked to indicate their own most important source for learning about specific federal job opportunities. Another question sought similar response concerning specific employment opportunities in industry. In each case seven alternative sources were provided, including an "other" category with a space for a write-in or free-answer. The respondent was requested to number the sources in order of importance.

Twenty and one-half percent of the seniors regarded their college placement office the most important source of information concerning specific positions open in the federal government. Newspapers, radio, and television ranked as the next most important, with 19.4 percent of the seniors. Representatives who visited the campus were considered the most important source by 13.5 percent of the seniors, ranking third. Faculty members, as a source of information, ranked fourth, 10.5 percent. "Other students" and "family" ranked fifth and sixth with 8.2 percent and 6.8 percent of the seniors rating them the most important source of information about specific federal jobs.

The pattern of seniors' response concerning sources of information about industrial jobs provides a sharp contrast. First, 30.6 percent regard the representative who visits the campus their most important source. Only 13.5 percent of the seniors had ranked such representatives the most important source concerning federal jobs. The 30.6 percent is approximately 10 percent higher than the first ranking federal source, the college placement office.

Seniors ranked their college placement office the second most important source of information concerning industrial jobs. The percentage, 24.4, is slightly above that for federal jobs, 20.5 percent.

No source other than these two was ranked first in importance by more than ten percent of the seniors. Family ranked third with 8.5 percent; faculty members fourth with 8.0 percent; newspapers, radio and television ranked fifth with 7.1 percent; and other students ranked sixth with 4.7 percent of the seniors considering them the most important source of information concerning industrial positions.

The most significant difference in comparison of seniors' sources of information concerning federal and industrial employment opportunities is the rank order of representatives visiting the college campus. Industrial

representatives were held in higher regard as sources of information concerning specific jobs than federal representatives. Another contrast in sources involves newspapers, radio, and television advertising. Seniors rely upon this source more for information about federal jobs, 19.4 percent, than about industrial jobs, 7.1 percent. The placement office was regarded of approximately equal importance as a source: federal jobs, 20.5 percent; industrial jobs 24.4 percent. Other sources fell into approximately the same rank order of importance for federal and industrial employment opportunities.

CHAPTER V

RELATIONSHIP OF ATTITUDES TO EMPLOYMENT DECISIONS

Summary of Employment Decisions

In Chapter III seniors' behavior in seeking employment has been described. To understand this behavior more adequately seniors' attitudes toward employment were examined in some detail in the preceding chapter. The objective of this chapter is to describe and analyze the relationship between students' attitudes toward employment and their behavior in federal and industrial recruitment processes.

Approximately four among every ten seniors had definitely accepted civilian jobs at the time of our visits. Three of the four with jobs had chosen industrial employment. The remaining senior who had accepted was likely to have accepted federal employment once out of every five times. Otherwise he chose educational or other types of employment. Thus, if we judge preference by definite acceptance of employment there is a strong preference for industry. Of course, the number of seniors accepting jobs in one field or another is affected by the relative size of industry, federal government, and others as employers of college seniors in the specialties included in this study. It is assumed, however, that the demand for college seniors had not been satiated by either industrial or federal employers, hence the seniors' employment preferences warrant further study in this period of competitive recruitment. Recruitment policy of federal employers should reflect an understanding of these preferences.

Students who had not definitely accepted civilian employment for the period after graduation were asked to indicate their preferences. Only five among every ten of these seniors stated that they expected to accept industrial employment either now or after graduate study or service in the armed forces. Two out of ten were undecided concerning their preferences and one out of ten expected to accept federal employment. Thus seniors in this group indicated less preference for industrial employment than the group of seniors with jobs, and slightly greater preference for federal employment than the first group.

Summary of student attitudes

Seniors' attitudes toward the comparison of federal and industrial employment have been assessed with a scoring sched-

ule. The average score for all seniors lies at a position on the scale of favor toward industrial employment. Thus, seniors prefer industrial employment if their average attitude score is selected as a single measure to describe them. This general measure of seniors' attitudes is consistent with their preference for industrial employment described above.

Attitude scores for individual seniors range from strong favor for industrial employment, through neutrality, to favor for industrial employment. Thus within the group of all seniors smaller groups might be found with less preference for industry and greater preference for federal employment. Two landmark groups were chosen for analysis. One group had indicated preference for industrial employment by definitely accepting a job in industry or expecting to accept such a job. The second group had indicated preference for federal employment by definitely accepting a job in the federal government or expecting to accept such a job. The average attitude score of the first group was favorable to industry, and that of the latter group favorable to federal employment. The difference between average scores was highly significant statistically. Therefore we assume a close relationship between our measure of attitude toward employment and our information on student choice of employment.

Recruitment policy can take cognizance of student attitudes toward employment only if these attitudes are described in sufficient detail. In the previous chapter such detail was provided by analysis of student response to the thirty-eight statements concerning employment which were presented to them.

Most important considerations in choice of employment

To pin-point analysis of the effect of student attitude upon employment decision, seniors were asked to list the four most important considerations in their final choice of a job. They were then requested to check the single consideration which was of greatest importance. Statements checked as most important were classified using the content areas mentioned in Chapter IV.

Approximately thirty percent of the seniors indicated that a general preference for the job was their first consideration. They expressed this in various ways, saying, "You must like the job," or like the "nature of the work," or "find satisfaction" in it, or "enjoy the type of work." Comparison of these expressions with the more specific content of other individuals' remarks and with the more specific con-

tent of most of the scale statements provided the basic experience for classifying these statements of the most important consideration in choosing a job as "general preference." (See Table XXIV.)

Eighteen percent of the seniors regarded promotion their most important consideration. These statements were much more specific in content than those concerning preference. All concerned a person's prospects for promotion.

No other content area was regarded the most important consideration by over ten percent of the seniors. Pay and professional development were third and fourth considerations with 7.4 percent and 7.0 percent respectively. Job security ranked fifth with 5.8 percent, working conditions sixth with 5.3 percent, and recruitment seventh with 2.1 percent. Benefits, that is vacation pay, sick leave policy, and retirement were not regarded the most important consideration by any senior.

This description of seniors' considerations in choosing employment provides a frame of reference for analyzing the content of their attitudes toward employment described in Chapter IV. Table XXII of Chapter IV lists attitude content areas in decreasing order of preference for federal employment.

General preference for the job was held to be the most important consideration in choosing a job by thirty percent of the seniors. Response of all seniors to the three attitude statements measuring general preference averaged a score of 1.05 units which was the most favorable score to industrial employment of any attitude area. Promotion ranked second in importance in choosing a job. Yet response of all seniors to two attitude statements concerning promotion averaged 1.38 units. This score was the third most favorable to industry. Both of these average scores are considerably more favorable to industry than the average score of those students who had definitely accepted or who expected to accept industrial employment, 1.54 units.

Pay ranked third as a consideration in choosing a job, yet senior response to five statements concerning pay was highly favorable toward industry, 1.22.

It should be noted that student response to attitude statements in two areas was more favorable to federal employment than the average score, 2.07 units, of students accepting or expecting to accept such employment. Three statements concerning benefits averaged 2.47 units. Two statements con-

TABLE XXIV

SENIORS' MOST IMPORTANT CONSIDERATIONS IN CHOOSING EMPLOYMENT*

Consideration	All seniors	Engineers	Science	Social science
General preference	29.4	29.9	36.0	24.7
Promotion	18.0	17.6	15.0	17.3
Pay	7.4	7.5	6.0	8.6
Professional development	7.0	6.6	8.0	7.4
Job security	5.8	6.9	2.0	4.3
Working conditions	5.3	2.8	14.0	7.4
Recruitment	2.1	1.7	1.0	3.8
Benefits	0.0	0.0	0.0	0.0
Miscellaneous and no answer	25.0	27.0	18.0	26.5
Total	100.0	100.0	100.0	100.0

* Numbers in this table are percentages.

cerning job security averaged 2.21 units. But, as observed above, benefits were not regarded the most important consideration in choosing employment by any senior. Job security rated the most important consideration by only five percent of the seniors.

In other words, seniors regarded industrial employment more favorably than federal employment in those considerations which are most important to them in choosing a job. This analysis of seniors' attitudes toward employment and their basis for choosing specific jobs explains at least in part their behavior in the recruitment process. Most are industry oriented in their attitudes and choose employment in that field.

Sources of advice concerning job decision

Further understanding of the behavior of seniors in the recruitment process may be developed by analysis of their sources of advice in making their job decisions. Each was asked to indicate the source which he found most important in deciding the advisability of accepting a specific job. Six specific answer categories and one free response were provided. The student was asked to number these alternatives in order of importance.

The representative who visited the campus was chosen most important by twenty-six percent of the seniors. Faculty members were regarded the most important source of advice by twenty-one percent of the seniors. The family ranked third, being chosen by thirteen percent. The placement office was chosen by only eight percent, other students by four percent, and newspapers, radio, and television by two percent. (See Table XXV.)

This description of sources of advice can be compared with students' ranking of sources of information concerning specific federal and industrial job opportunities. The representative was considered the most important source of advice in deciding whether or not to accept a job. Industrial representatives were regarded the most important source of information concerning specific industrial job opportunities. Federal representatives ranked third in importance as sources of information concerning specific federal job opportunities. Thus, industrial recruitment in the student's view is oriented around the source most valuable to the student, the representative who visits the campus. Federal recruitment is not as effectively oriented around the representative according to the student's evaluation of the process.

TABLE XXV

SENIORS' MOST IMPORTANT SOURCE OF ADVICE IN JOB CHOICE

Source	Percent of seniors
Representative who visited campus	26.4
Faculty members	20.8
Family	12.6
Placement office	7.7
Other students	4.1
Newspapers, radio, and television	2.0
Other sources and no response	26.5
Total	100.1

Faculty members ranked second as sources of advice. As sources of information concerning specific federal jobs they ranked fourth with 10.5 percent. As sources of information concerning specific industrial jobs they ranked fourth also, but with 8.0 percent. No particular advantage accrues to either federal or industrial recruitment efforts through student use of faculty members as sources of advice and information.

Pay

Pay is regarded to be an important factor in occupational choice. The Bush study of engineering students in 1951 indicated that pay was considered to be a disadvantage of federal employment and an important advantage of industrial employment. It has already been noted that our study this spring indicated that pay was regarded as the most important factor in choosing a job by only seven percent of the seniors. On the other hand, seniors indicate a strong favor for industrial employment when responding to statements concerning pay. Their response on these questions was more favorable to industry than the average score of the group choosing industrial work.

Within this setting it is interesting to note that the median annual salary for the group of seniors who had definitely accepted employment was $4020, that is, $335 per month. Approximately one percent of those with jobs said their annual salaries were $3000 or below. Forty percent ranged between $3000 and $3999. Forty-three percent ranged between $4000 and $4999. Five percent of the seniors said their annual salaries were $5000 or above. Eleven percent of those who had accepted jobs did not respond to this question.

CHAPTER VI

SUMMARY OF FINDINGS

This study has been conducted under a contract "... to determine reasons why college students do not apply for Government employment in science and engineering ..." The study is oriented around the need to build a more accurate description of college seniors' behavior and attitudes in the federal recruitment process. Thus, it is in the form of a monograph. Recommendations concerning federal recruitment policy and future relations with the colleges are not made.

The specific objectives of the study are:

(1) To measure more precisely students' attitudes toward federal employment as compared with industrial employment.

(2) To discover the degree to which students' attitudes concerning the advantages and disadvantages of federal and industrial employment, derived from interview and questionnaire comment in the pilot study, influence job decisions.

(3) To discover (a) the sources of information concerning employment which influence the student as he makes his job decision and (b) the relative values which he assigns to these sources.

(4) To discover: the attitudes of faculty members toward the factors of employment influencing students; faculty members' sources of information; and the relative values they assign to these sources.

(5) To compare (a) student and faculty attitudes and sources and (b) attitudes of engineering students with those of science and social science students.

(6) To determine the time when college seniors make their final decision to accept or reject specific employment opportunities.

Employment decisions

Seniors demonstrated a strong preference for industrial employment over other types of employment when they made their job decisions. Approximately four among every ten seniors had definitely accepted civilian jobs at the time of our visits

to the colleges. Three of the four with jobs had chosen industrial employment. The remaining senior who had accepted was likely to have accepted federal employment once out of every five times. Otherwise he chose educational or other types of employment.

Of course, some students were going into the armed forces and some into graduate or professional study. When those going into the armed forces and those going into graduate study are added to those who had definitely accepted civilian jobs, the total includes seventy-six percent of the seniors. Thus, at the time of visits (April and May) approximately one-fourth of the seniors were still undecided about what they would do after graduation.

Attitudes toward employment

Measurement of students' attitudes indicates strong preference for industrial as compared with federal employment. Their average attitude score is more favorable to industry than average scores for faculty members or graduate students. Only thirteen percent of the seniors' scores were more favorable to federal than industrial employment.

Seniors' attitudes toward federal as compared with industrial employment vary with their field of college major. For example, students majoring in mechanical engineering were more favorable toward industry than those students who chose jobs in industry, while students majoring in political science were as favorable toward federal employment as students who chose federal jobs. When the eight fields of college major were combined into three, engineering, science, and social science, it was discovered that, although they all favored industrial employment, those in engineering favored industry greatest, science majors favored industry with less intensity, and social science majors favored industry with still less intensity.

Seniors' attitudes toward employment also vary among institutions. Again, seniors at all five institutions average scores favorable to industrial employment. However students at Purdue University, West Virginia University, and Johns Hopkins favor industry with significantly greater intensity than do students at Oberlin College and Syracuse University.

Seniors' previous employment experience affects their attitudes toward employment. Those with previous experience in industry are significantly more favorable toward industrial employment than are those with no previous employment experience. Seniors with previous employment in the federal govern-

ment hold attitudes favorable toward industrial employment but with much less intensity than other students. Their scores approach neutrality. On the other hand, fifty-seven students claimed previous employment in both industry and federal employment. Their attitudes were as favorable toward industry as those of students with industrial experience alone.

Many students had participated in summer training programs in industry and the federal government. Both groups' attitudes were favorable to industrial employment. However, the intensity of favor for industry was significantly less among those seniors having participated in federal training programs.

Generally speaking, previous employment experience did not result in attitude preference for the respective type of employment of as great intensity as that held by students accepting such employment. However, students with previous employment experience in federal or industrial employment were more favorable toward such employment than were students generally.

Students with fathers or guardians whose occupations were in industry were distinctly more favorable toward industrial employment than those students whose fathers or guardians were employed in the federal government. However, both groups favored industrial employment.

Students' attitudes toward employment do not vary consistently with scholastic standing. Preference for industrial or federal employment is not of greater or lesser intensity as students' scholastic standing varies. Similarly, veteran students' attitudes toward federal and industrial employment were not significantly different than those of non-veterans. On the other hand, men were more favorable toward industrial employment than were women. (The sex attitude differential may be due to differences in distribution among majors and institutions.)

The content of student favor for industrial employment can be described by examining the ten statements upon which their response averaged greatest favor for industry. Seniors registered their greatest intensity of favor for industry in response to a statement concerning the likelihood of higher pay for higher level positions. They also regarded pay to be more dependent upon ability in industry than in government. They felt that students with greatest ability were more likely to enter industrial employment, although response to this

statement could not be substantiated by analysis of attitude scores and job decisions.

The seniors felt that other students would be more inclined to work for industry than government. They felt there was a greater incentive for the employee to work, and that the employee is more likely to work harder in industrial employment than in federal employment. Management efficiency in general and particularly in the student's specialty were regarded to be greater in industrial than in federal employment. Students expected industrial supervisors to be more competent than those in government. In addition, they regarded industrial employment as more likely to facilitate their professional development.

It was felt that the individual works "under pressure" less frequently in government than in industry. Student response to this statement was more favorable to federal employment than response to any other statement. Next most favorable response concerned the statement that experience in government becomes a good recommendation for future work in industry. Response was also favorable to the federal government on statements concerning job security, vacation leave policy, sick leave policy, and retirement.

Government was regarded as providing better equipment for technical work. Discrimination against the individual was regarded as less likely. Finally, the geographic location of federal positions was looked upon with favor.

The degree to which these attitudes toward industrial employment and federal employment represent stereotypes or the degree to which they are based upon fact or misconceptions cannot be assessed here. It is sufficient for our purpose to note that attitudes like these provide the framework within which students make their job decisions.

Another analysis of the content of student attitudes was made by use of analytical scores for groups of related statements. Response in these content areas has been arranged by degree of favor for federal or industrial employment. Response to statements concerning benefits and job security was more favorable to federal than to industrial employment. In all other areas industry was favored. In order of increasing favor for industry these areas are: recruitment, professional development, working conditions, promotion, pay, and general preference.

Seniors differ in their evaluation of the importance of various sources of information concerning federal jobs com-

pared with the importance of sources of information concerning industrial jobs. For industrial jobs, the representative who visits the campus and the placement office are regarded the most important sources. For federal jobs, the placement office and newspapers, radio, and television combined are regarded as the two most important sources. The representative ranks third and faculty members fourth as sources of information concerning specific federal job opportunities.

Relationship of attitudes to employment decisions

Seniors' employment decisions appear to be consistently related to their attitudes toward employment. Their average attitude scores are distributed in the approximate pattern of their job decisions. For example, if all students who said they expected to accept federal jobs are added to those who said they had definitely accepted federal jobs they total eight percent of all seniors. This figure approximates closely the thirteen percent of the seniors whose average attitude scores were above neutrality and in favor of federal employment.

Average attitude scores for the group of seniors choosing industrial employment were significantly different from those choosing federal employment. These scores have been employed as landmarks on the attitude scale in further analysis of scores.

Analysis of the student's most important consideration in choosing employment pin-points study of the relationship of his attitudes toward employment to his employment decision. General preference for the job ranked first in importance, promotion second, and pay third. It should be noted that student response to the thirty-eight attitude statements was classified in the same categories. These three content areas were those most favorable to industry. Thus, in the considerations most important to seniors in choosing employment industry was definitely favored over government.

Conversely, no student regarded benefits his most important consideration, and job security was held the most important consideration by only six percent of the students. However, these two content areas were those of response most favorable to federal employment. Hence, students regarded federal employment most favorable in those areas of least importance in choosing a job.

Students evaluated the importance of their sources of advice in making theiremployment decisions. The representative who visited the campus ranked first, faculty members second, family third, and placement office fourth. These judg-

ments were compared with seniors' ranking of sources of specific information concerning industrial and federal job opportunities. Representatives who visited the campus ranked first in importance as a source of information concerning industrial jobs but only third as a source concerning federal jobs. Thus, industrial recruitment efforts stress that source of information which is also regarded by seniors to be the most important source of advice. Student impressions of the importance of federal sources do not coincide with their impressions of their most important source of advice. Newspapers, radio, and television and the placement office were ranked above representatives as sources of federal job opportunities.

Opportunities for further research

(1) The description of college seniors' attitudes toward federal employment presented in this monograph should be compared with federal recruitment policy generally and with the recruitment activities of particular agencies. Detailed and systematic comparison would be more appropriately conducted by persons within the federal government. Results of such comparison should be channeled to persons engaged in recruiting college seniors.

(2) The techniques employed in the current study resulted in the discovery of differences in seniors' attitudes toward federal employment at different colleges. In order to determine how these differences occur, two extreme groups of colleges should be selected for further study. One group should include those colleges with which federal relations are excellent in the judgment of a group of federal recruiters. The other group should include colleges with which federal relations are poor in the judgment of federal recruiters. A detailed analysis of these two groups of colleges should be made to discover the causes of poor or excellent relationships. One element in such a study would be the measurement of student and faculty attitudes toward federal employment.

(3) If a new policy toward college recruitment is developed, it should be tested at several colleges before finally implemented. Before-and-after study or a control group study of seniors' attitudes could be conducted at these institutions to determine the impact of the new policy.

(4) Summer training programs should be tested for their effect on student attitudes and employment decisions. A before-and-after technique or control group technique could be employed.

(5) Federal recruitment literature including announcements and other forms should be examined for their impact upon the student. The effectiveness of distribution, readibility of the text, and effectiveness of communication of content should be studied.

(6) Several studies have been conducted to assess the attitudes of scientists and engineers toward federal employment. The findings of these studies should be brought together in the same general work.[1]

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[1] A partial listing would include:

Steelman, John R., Appendix III, Opinions of Scientists about their work, its satisfactions and some of its requirements in administration for research, Vol 3, of Science and Public Policy: A Report to the President. Washington, D. C.: Government Printing Office, October 4, 1947.

Ahlberg, Clark D., and Honey, John C., Attitudes of Scientists and Engineers about their Government Employment. Vol I. Syracuse, New York: The Maxwell Graduate School, Syracuse University, July 1950.

Bush, George P., Engineering Students and Federal Employment. Washington, D. C.: The American University, July 1951.

Bush, George P., and Hattery, Lowell H., Federal Recruitment of Junior Engineers," Science, 14: 455-458, November 2, 1951.

APPENDIX A

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FEDERAL RECRUITMENT OF JUNIOR ENGINEERS[1]

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Engineering students and their professors challenge the personnel policies and procedures of federal agencies. June graduates, furthermore, found better-paying jobs awaiting them in industry than in government. Substantial changes in policy, procedure, and public relations are in order if federal agencies are to be in a favorable competitive position for obtaining young engineering talent.

These conclusions arise out of a study of attitudes of June graduates, deans of engineering schools, engineering professors, and placement officers in engineering colleges. The major purpose of the study was to determine the reason why engineering students did or did not apply for U. S. Civil Service Commission examinations in the fall and spring of 1950-51. High lights of the accumulated data relating to the

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1. This article is based on the full report of a study conducted by The American University and supported by funds from the Manpower Branch, Human Resources Division, Office of Naval Research. George P. Bush was principal investigator and chairman of a university committee for the project, composed of Catheryn Seckler-Hudson, Lowell H. Hattery, Charles M. Hersh, and Robert T. Bower. An advisory committee of federal officials contributed to the planning of the study. The advisory committee was composed of Milton M. Mandell, U. S. Civil Service Commission, chairman; Ralph M. Hogan, Office of Naval Research; D. R. Hicks, Bureau of Reclamation; Charles W. Fotis and Lionel Murphy, Air Research and Development Command Headquarters; Raymond Randall and George Porter, National Bureau of Standards; William T. Pecora, U. S. Geological Survey; and Henry A. Sawchuck, U. S. Civil Service Commission.

specific problem, and more generally to engineering student attitudes toward federal employment, are summarized in this article.[2]

Campus visits were made to six engineering colleges in the eastern United States, selected to represent different environmental factors.[3] Students in civil, electrical and mechanical engineering were asked to fill out questionnaires, and a sample number were interviewed individually. Deans of engineering schools, engineering professors, and placement officers were also interviewed.

The questionnaire. Students were asked to fill out a four-page questionnaire, which was administered in about twenty minutes. The questionnaire asked the student to check classificatory information, and to provide information relative to civil service examinations. Six statements of general attitude toward working in government compared with industry were included, and the students were asked to indicate their degree of agreement or disagreement on a five-place response scale. Finally, five open-end questions were asked relating to the students' opinion concerning advantages and disadvantages of federal and industrial employment in engineering.

Six hundred usable questionnaires were collected from 39.8% of students who were to graduate in June. Responses indicated a conscientious effort to be thoughtful and sincere in their answers.

Interviews. Seventy-six students were interviewed individually in open-end interviews lasting 10-75 minutes, with most interviews lasting about 15 minutes. Immediately following the interview, a written record of pertinent comments was made. As many as 16 different classifiable comments

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2. For a full report of findings, see G. P. Bush, Engineering Students and Federal Employment. Washington, D. C.: Am. Univ. (1951). Available on loan from R. M. Hogan, Manpower Branch, Human Resources Division, Office of Naval Research, Washington 25, D. C.

3. College of the City of New York, Cornell University, Drexel Institute of Technology, North Carolina College of Agriculture and Engineering, Rensselaer Polytechnic Institute, and West Virginia University.

relating to student attitudes toward federal employment were noted in one interview. The average was 7.5 per interview.

Fifteen engineering professors were interviewed, and six others submitted written comments. Three deans of engineering colleges were interviewed, and a fourth submitted written comments. The notes made after each faculty interview were analyzed for attitudinal statements and such statements classified and tabulated.

Since the placement officer is often the focal point of campus recruitment, extensive interviews were held with placement office staffs at each of the six colleges. One such interview yielded 31 classifiable attitudinal comments.

Analysis of the data. Most of the data collected were subject to statistical tabulation and analysis. Responses to open-end questions and interview comments were classified and tabulated by an inductively developed classification scheme of 88 categories. To facilitate analysis these categories were grouped into several areas of personnel administration to which they were related: recruitment and selection, position classification and pay, placement, training, management-worker relationships, separation and retirement, and miscellaneous.

Examination of interrelationships of data collected by student questionnaire and by student, faculty, and placement officer interview revealed no substantial conflicting testimony but a number of interesting variations in emphasis.[4]

STUDENTS FAVOR INDUSTRIAL WORK

In their agreement-disagreement response to six statements comparing government and industrial work, students showed a generally unfavorable attitude toward government. For example, students were asked to indicate their agreement or disagreement with the following statement:

> I would have greater opportunity for professional growth and development in government than in industry in my field.

Students were asked to check one of five degrees of agreement: strongly agree, tend to agree, neither agree nor disagre, tend to disagree, or strongly disagree. Of those who indicated strong agreement or disagreement, 13 strongly

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4. Complete classification system and tabulations of the data are presented in the full report of the study.

agreed and 202 strongly disagreed. Students felt, even more strongly, that the opportunity for financial return from a career in government was less favorable than from a career in industry. Four felt strongly that the prestige of government employment was higher than for industrial employment, whereas 194 felt strongly that prestige of government is less than industrial employment. Unfavorable attitudes toward government employment compared with industrial employment, though less strong, were nevertheless marked with respect to the interesting nature of the work, contribution to engineering field, and training received. Totals of responses to the six statements, which were composed in a form favorable to government employment over industrial employment were:

Strongly agree	71
Tend to agree	362
Neither agree nor disagree	773
Tend to disagree	1,382
Strongly disagree	974

Seventy-two students who had previous government employment experience showed little variation in their attitudes from those of the total group, though they were more favorable toward the interesting nature of the work in government, but less favorable toward government employment in terms of prestige.

ADVANTAGES AND DISADVANTAGES OF FEDERAL EMPLOYMENT

Students were queried both by questionnaire and by interview about their opinions concerning the advantages and disadvantages of federal and industrial employment. It was obvious in some cases that the student's opinion was not supported by fact; nevertheless, his opinion, even though specious, may be effective in his motivation.

Recruitment factors. Students mentioned job security as a factor favorable to government employment more often than any other. Job security was listed as an advantage by 336 students; job insecurity was listed as a disadvantage of industrial employment by 257 students. Fifty-six students, however, considered job insecurity a disadvantage of government, and 39 students considered job security an advantage of private industry.

Surprising to the investigators, in view of the federal civil service system, was the degree to which political influence was considered a disadvantage of federal employment. Eighty-four students referred to political influence as a disadvantage of federal employment with such remarks as:

"There are too many political connections necessary ... it's not what you know but who you know--in spite of apparent merit systems," "The top jobs are obtained through political influence," and "In the civil service you frequently reach a point where some politicians cross you up."

Location of the job, because of uncertainty or undesirability of location, was an unfavorable factor for federal employment. One student commented, "Federal employment would most likely take me from my desired working area; place me at some undesirable location ..." Another said, "It's virtually impossible to move and find housing when you have children."

There was indication that the students believe there is greater variety of engineering jobs in industry. Sixty-six students listed this factor as an advantage of industry, 16 listed lack of variety in kinds of jobs as a disadvantage of government. On the other hand, 32 students considered variety of positions an advantage of federal employment.

Pay. Throughout the study, higher starting pay and higher pay in higher grades were preponderant disadvantages of government and advantages of private employment. One student said simply, "Industrial offers of more money just can't be overlooked." That the pay differential is an actual deterrent to accepting federal employment was admitted by students in such comments as: "I would like to work for civil service, but the difference of $500-$800 in pay is too much;" and "I would have given much more consideration to the Naval research program had the starting salary been a little higher." More than half the students who filled out questionnaires cited pay as a disadvantage of federal employment.

Promotion. The government fared little better in the matter of promotion, which is, of course, related to pay. Only five students listed promotion by merit as an advantage of federal employment, contrasted with 96 students who considered the lack of it a disadvantage, and 117 who considered it an advantage of private employment. Some typical comments concerning federal promotion were: "Have lived most of life in D. C. ... Have seen too many capable men stuck, half way up," "You have to wait for someone to die to get ahead in civil service," "The ambitious cannot rise in the civil service due to politics." The dean of an engineering school commented: "My son graduated from N. In a year he has had three jobs, each better than the last. How can a young man do this in government? If it can be done, then we on the outside are not told and hence presume that a person is stuck in his job once in."

Training. Training opportunities, through both formal training programs and experience, were rated about even between federal and private employment. Most students who mentioned opportunities, funds, and facilities for research cited them as advantages of federal employment. This indicates that federal agencies engaged in research are in a more favorable position for recruiting engineering talent than other federal agencies. One student pointed out that, in his opinion, "government work is good only for research and development for engineers."

Unfavorable to government is the conception among a number of students that industry has regular training programs for junior engineers, whereas government does not.

MANAGEMENT AND WORKING CONDITIONS

Federal employment showed up well in student comments on welfare phases of working conditions, such as annual leave, sick leave, retirement provisions, short working hours, less pressure on employees, better equipment. For example, 168 commented on annual leave provisions as an advantage of government employment.

On the other hand, the tradition of red tape in government was strong among the students, 171 of whom cited inefficiency of management as a disadvantage of federal employment, whereas 124 cited efficiency of management as an advantage of private employment. Some typical comments about government management are: "Decisions can't be made and put through in a fast, efficient manner," "In my estimation the government has a reputation for ... having incompetent supervisors," "I am not attracted to government service because of the seeming maze of red tape."

Several categories of student comments seemed to relate to morale. These included references to incentives, independence, restrictions and regimentation, prestige. Federal employment showed up unfavorably in this area, with a net of 139 citations of disadvantages in federal employment and a net of 140 citations favorable to private employment. Some comments: "Classmates look with scorn on anyone even considering government employment," "Federal employment does not stimulate initiative," "In general, individuality seems to be lost in government service."

Private enterprise. Student comments in interviews generally paralleled attitudes expressed in questionnaires. There was, however, distinctly greater emphasis on the issue of private enterprise versus government enterprise. The fol-

lowing remarks, taken from the interviewer's notes, are descriptive of attitudes expressed. "They (government jobs) do not interest me, because I am convinced that there are too many on government payrolls, and the free enterprise system may break down." "I don't believe in government jobs." "There is no background of civil service in my family, and I was headed for industry since I first came here." Student and faculty interviews suggest that children of parents employed in industry tend to prefer employment in industry and children of parents employed in government tend to prefer employment in government.

FACULTY ATTITUDES

On the assumption that professors may influence students' attitudes and employment preferences, extensive interviews were held with faculty members at each of the engineering colleges, and several professors filled out a schedule listing advantages and disadvantages of federal and industrial employment.

Engineering deans and professors reflected a configuration of attitudes similar to that of their students. One departmental chairman, when asked to enumerate advantages of federal employment for a young electrical engineer, answered after some thought, "None." Engineering faculty stressed lower pay, lack of promotion by merit, and adverse morale factors as disadvantageous to federal employment.

Constructive suggestions were offered in several areas. More favorable publicity and public relations by federal agencies were stressed. Establishment of a tradition of going into public service was considered important to successful recruitment. And, of course, a competitive pay schedule was deemed essential. Although the majority of engineering faculty members were less favorably disposed to federal than to industrial employment for junior engineers, there was substantial evidence of conscientious attempts to bring federal employment opportunities to the attention of engineering students. One professor said, "I try to sell government service to my students."

FEDERAL RECRUITMENT RELATIONS

Engineering deans and placement officers were frankly critical but sincerely constructive in discussing experience with direct recruitment by federal agency representatives. The apparent failure of government recruiters to recognize the autonomy of the school is the occasion for criticism on the part of several placement officers. Placement officers

complained of (1) the manner of dealing with the college as though it were a land-grant college and (2) the fact that, having been given a scheduled time for interviews, government recruiters frequently arrived late or failed tc appear.[5] In contrast, the recruiter from private industry first asked permission to visit the campus at the convenience of the college, and then meticulously met his interview schedule.

Another complaint against government recruiters is their inability to make a good personal impression either on the students or on the placement officers, through lack of knowledge of jobs for which they are recruiting, and lack of technical background in the field. As one placement officer expressed it: "Too many government recruiters are 'nice fellows' but spend too much time explaining 'sick leave' and don't know professional engineering." In contrast, one placement officer cited an instance in which the industry recruiter "is unusually tactful in his dealings with the placement office. He knows his company; he knows the way the placement office operates; he asks specifically for what he wants; and he gets the men. On occasion he will bring along a specialist from a particular plant."

Only two instances were cited as favorable to government recruiters. One military establishment "sent a four-man team composed of a personnel specialist, a civil engineering supervisor, a mechanical engineering supervisor, and an electrical engineering supervisor. The personnel man interviewed first on personnel matters, and the subject matter interview followed. This seemed an excellent procedure to the placement officers."

Placement officers of all the schools were impressed with the lack of organization of government recruiters after their arrival on the campus. Their interviews were not well planned. They demanded interview schedules on short notice, and no definite jobs were offered. In one instance, on request on a federal agency, 350 students with the help of the placement officer filled out Civil Service Commission Form No. 57 for summer employment and delivered the completed forms to the government installation in person. Up to the time of interview no student had received an offer of employment. Apparently the agency had retrenched in its summer employment policy.

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5. From interview notes: "Both the placement officer and the students took on a decided anti-government stand when a government interview team from _____ failed to show up for scheduled interviews. This affected all 'government' not just _____."

A particularly bad impression was made upon placement officers by one team of federal recruiters. A placement officer reported, "One (recruiter) was cocky, the other three pleasant to deal with. They wanted to interview students on very short notice ... . Evidently they were not experienced with campus contacts." In contrast, one company in private industry sent the company plane to the campus, picked up four interviewees and a member of the placement office staff and flew them to the home office and back: "All interviewees are signing up."

APPEAL OF CIVIL SERVICE ANNOUNCEMENTS

Of 339 students who saw the announcement of the U. S. Civil Service Commission examination for junior scientists and engineers dated October 1950,[6] 41 students took the examination. Thirty-nine students had been notified they were on the register as having passed the examination.

COMPETITIVE RECRUITMENT: A FRAME OF REFERENCE

There is a shortage of junior engineers, and competition exists for the available supply, especially for those of greatest talent and ability. The federal government has a large demand for junior engineers to man its numerous projects. Some of them can be run of the mine, but others must possess outstanding talent and ability. Industry also needs engineers. The armed forces need engineers for military service. Industry assiduously combs the campus for recruits, and the federal government through its announcements and recruiters attempts to get its share of the graduates.

In this milieu we find the student subject to three principal recruiting systems: the military services, industry and the federal government. There are other avenues into which the student may go, such as continued education, teaching, state or municipal government. The student choice is affected by the relative advantages and disadvantages, either real or fancied, of available employment. The study indicates certain attitudinal factors which seem to deter students from entering federal employment, and which decrease the effectiveness of government recruitment.

Some of the adverse factors, such as lack of prestige in federal employment, can be changed only slowly. Political influence as a deterrent may or may not be amenable to cor-

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6. U. S. Civil Service Commission Announcement No. 250, dated October 17, 1950.

rection. Other factors could readily be changed once their importance is properly appreciated. The study indicates deficiencies in the policies, organization, and methods of federal recruitment, many of which could be substantially improved. Some adverse attitudes toward federal employment for engineers are based on at least partial misconceptions. This indicates the need for a better flow of information about federal employment opportunities to engineering faculties and students.

So far as junior engineers are concerned, the government is in an adverse competitive position. "Security" and "benefits" in federal employment are important, but there are many other factors that tend to offset or cancel out these familiar standbys.

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7. For an indexed bibliography see the full report of the study.

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APPENDIX B

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APPENDIX C

Bu.Budget Approval No.45-5201
Expires 30 June 1953

EMPLOYMENT PREFERENCES OF COLLEGE SENIORS

The American University has been asked by the Office of Naval Research to carry out a study to learn more about the employment preferences of college seniors in certain fields. It will help us in our study if you will answer carefully the questions below.

Do <u>not</u> sign your name to this questionnaire.

WORKING IN THE FEDERAL GOVERNMENT COMPARED WITH WORKING IN INDUSTRY

Please indicate the extent of your agreement or disagreement with each statement by <u>checking the box which most nearly represents your own opinion.</u> Think in terms of your own college field of engineering, chemistry, psychology, etc.....

	strongly agree	tend to agree	neither agree nor disagree or don't know	tend to disagree	strongly disagree
1. Students with training similar to mine are more inclined to work in private employment than for the federal government.	☐	☐	☐	☐	☐
2. Employment in my field in a business or industrial concern is more likely to be permanent than employment in a federal organization.	☐	☐	☐	☐	☐
3. There is a better chance for me to develop professionally in the federal civil service than in private industry.	☐	☐	☐	☐	☐

	strongly agree	tend to agree	neither agree nor disagree or don't know	tend to disagree	strongly disagree
4. Experience gained in federal employment in my field is more varied than that gained in private industry.	☐	☐	☐	☐	☐
5. Experience gained in federal employment becomes a poor recommendation for future work in industry.	☐	☐	☐	☐	☐
6. Opportunities for additional training in my professional field are greater while working in private industry than in government.	☐	☐	☐	☐	☐
7. A person working for the federal government in my field has greater job security than in private industry.	☐	☐	☐	☐	☐
8. Students interested in research work in my field will find greater opportunity in federal employment than in private industry.	☐	☐	☐	☐	☐
9. Positions in the federal civil service are poorly located geographically for me, when compared with those in private industry.	☐	☐	☐	☐	☐
10. The federal civil service provides more opportunity to select the geographic location of your work than does private industry.	☐	☐	☐	☐	☐
11. In my field a greater variety of positions is offered by the federal civil service than by private industry.	☐	☐	☐	☐	☐

	strongly agree	tend to agree	neither agree nor disagree or don't know	tend to disagree	strongly disagree
12. In my field management efficiency is greater in private industry than in government.	☐	☐	☐	☐	☐
13. In other fields as well as in my own field, management efficiency is greater in private industry than in government.	☐	☐	☐	☐	☐
14. A person's immediate supervisors are more likely to be competent in federal government employment than in private industry.	☐	☐	☐	☐	☐
15. Working conditions in the federal government are better than in private industry.	☐	☐	☐	☐	☐
16. Private industry provides better equipment for technical work than is found in federal agencies performing similar work.	☐	☐	☐	☐	☐
17. In my field, individual initiative on the job is given higher recognition in government than in similar industrial work.	☐	☐	☐	☐	☐
18. Professional people working for the federal government encounter more "red tape" than those working in industry.	☐	☐	☐	☐	☐
19. The individual works "under pressure" more frequently in government than in private industry.	☐	☐	☐	☐	☐
20. A person in my field doesn't have to work as hard in private industry as in government.	☐	☐	☐	☐	☐

	strongly agree	tend to agree	neither agree nor disagree or don't know	tend to disagree	strongly disagree
21. The federal government provides greater incentive for the employee to work than private industry.	☐	☐	☐	☐	☐
22. Starting salaries are more likely to be adequate in federal government than in private industry.	☐	☐	☐	☐	☐
23. Pay is more dependent upon ability in private industry than in government.	☐	☐	☐	☐	☐
24. Pay for the higher level positions in my field is likely to be greater in industry than in government.	☐	☐	☐	☐	☐
25. A career in federal civil service offers greater opportunity for long range financial return than a similar career in private industry.	☐	☐	☐	☐	☐
26. Increases in pay occur more frequently in government than in private industry.	☐	☐	☐	☐	☐
27. Advancement by promotion is more rapid in government than in industry.	☐	☐	☐	☐	☐
28. Promotions are more often based upon merit in industry than in government.	☐	☐	☐	☐	☐
29. Vacation with pay policy is more liberal in government than in industry.	☐	☐	☐	☐	☐

	strongly agree	tend to agree	neither agree nor disagree or don't know	tend to disagree	strongly disagree
30. Sick leave policy is more liberal in industry than in government.	☐	☐	☐	☐	☐
31. Government offers a more beneficial retirement system than industry.	☐	☐	☐	☐	☐
32. Students in my field are more familiar with the facts about federal employment than they are about private employment.	☐	☐	☐	☐	☐
33. Working conditions in the federal civil service are better than in private industry.	☐	☐	☐	☐	☐
34. Students not having "pull" make out better in industry than in the federal civil service.	☐	☐	☐	☐	☐
35. One's personal beliefs are more likely to affect his chances of obtaining government employment than industrial employment.	☐	☐	☐	☐	☐
36. Discrimination against the individual is more likely in private industry than in government.	☐	☐	☐	☐	☐

	☐ strongly agree	☐ tend to agree	☐ neither agree nor disagree or don't know	☐ tend to disagree	☐ strongly disagree
37. It takes less effort to obtain a job with the federal government than to obtain a job with industry.					
38. Students with the greatest ability are more likely to enter private industry than government service.					

39. What other comparisons between private and public employment do you think are important in choosing a job?

a. _____

b. _____

c. _____

d. _____

MAKING A CHOICE

Which of all the considerations are most important to you in the final choice of a job? <u>List four and then check the most important.</u>

_____

_____

_____

_____

SOURCES OF EMPLOYMENT INFORMATION AND ADVICE

1. From which of the following sources have you learned about specific federal government job opportunities? Number in order of importance as a source of information.

Newspapers, radio, television	_____	Faculty members in your department	_____
Representative who visited campus	_____	Other students	_____
		Family	_____
Your college placement office	_____	Other (specify)	_____

2. From which of the following sources have you learned about specific private industry job opportunities? Number in order of importance.

Newspapers, radio, tele ision	_____	Faculty members in your department	_____
Representative who visited campus	_____	Other students	_____
		Family	_____
Your college placement office	_____	Other (specify)	_____

3. Which sources have you found to be most important in deciding the advisability of accepting a specific job? Number in order of importance.

Newspapers, radio, television	_____	Faculty members in your department	_____
Representative who visited campus	_____	Other students	_____
		Family	_____
Your college placement office	_____	Other (specify)	_____

JOB DECISION

Have you definitely accepted a civilian job for the period following graduation?
Yes_____ No_____

If Yes:

Is the job in: Industrial employment _____
Federal employment _____
Educational employment _____
Other (specify) _____

Is the work primarily: Administrative_____
Research _____
Other (specify) _____

When did you accept? Month_____ Year_____

What is your approximate annual starting salary? _____

In order to accept this position, did you turn down a job in:
Industry _____
Federal government _____
Education _____
Other (specify) _____

If No:

Are you going into the armed forces?
Yes_____ No_____ Undecided_____
If Yes: For a career? Yes_____ No_____ Undecided_____

Are you going into graduate or professional study?
Yes_____ No_____ Undecided_____

If you are going to take a civilian job, is it likely to be in:
Industrial employment _____
Federal employment _____
Educational employment _____
Other (specify) _____

Is the work likely to be primarily:
Administrative _____
Research _____
Other (specify) _____

When do you hope to make you decision?
Month_____ Year_____

What approximate annual starting salary do you expect? _____

GENERAL INFORMATION

Male___ Female___ Age:_____years

Veteran___ Disabled or Purple Heart Veteran___ Non-Veteran___

1. Name of College or University: _____

2. What is your college major?
   Engineering: Chemistry _____ Economics _____
   Civil _____ Physics _____ Political Science_____
   Mechanical _____ Psychology _____
   Electrical _____ Other (specify) _____

3. When will you complete the requirements for your bachelor's degree?
   May or June 1952_____ Other: Month_____ Year_____

4. What is your approximate scholastic average?
   Upper 10% _____ Second quarter _____
   Next 15% _____ Third quarter _____
   Fourth quarter _____

5. Occupation of father or guardian:
   Is the job in:
   Industrial employment _____
   Federal employment _____
   Educational employment _____
   Other (specify) _____

EMPLOYMENT EXPERIENCE

Have you had previous employment in:

Industry? Yes_____ No_____

If Yes:

Length of experience _____ years.
Was the work related to the field of your college training?
Yes_____ No_____ Somewhat related_____
Was this a summer training program during your college
Yes_____ No_____ Don't know_____ career?

Federal Government? Yes_____ No_____

If Yes:

Length of experience _____ years.
Was the work related to the field of your college training?
Yes_____ No_____ Somewhat related_____
Was this a summer training program during your college
Yes_____ No_____ Don't know_____ career?
Highest grade level? _____

Educational? Yes_____ No_____

If Yes:

Length of experience _____years.
Was the work related to the field of your college training?
Yes_____ No_____ Somewhat related_____
Was this a summer training program during your college
Yes_____ No_____ Don't know_____ career?

APPENDIX D

THE LIKERT SCORING SCHEDULE TECHNIQUE OF MEASURING ATTITUDE

There are several well known techniques for constructing attitude scales: Thurstone's equal-appearing interval technique, Likert's scoring schedule, Guttman's scale analysis, Bogardus' social distance technique, and modifications or combinations of these techniques.[1] Each technique has its advantages and disadvantages. Choice of one over the other of these tools depends upon the requirements of the study at hand.

In the current study a single over-all measure of student attitude was desired. In addition it was regarded necessary to obtain a measure of the intensity of response to each of thirty-eight statements concerning employment. Further, it was considered desirable to obtain analytical scores for statements grouped by general content. The Likert technique is well suited to these requirements.

The pilot study had been employed to collect a large volume of student comment in his own words. These data became the source for scale statements of attitude toward employment. Student language was carefully paraphrased in the areas of most frequent response discovered in the pilot study. Statements were edited to exclude extreme views. Statements of fact were also eliminated. Complicated or indefinite terms were excluded. The final statements were the product of a pre-test upon American University students and the work of a three-man committee.

Approximately one-half the statements were worded so that agreement with the statement favored industry and one-half, federal government. Seniors' scores on these two groups of statements were very similar, 1,645 and 1,640. Thus, it is assumed that this factor did not bias the results.

Scale statements were submitted to the internal consistency test designed by Likert.[2] Twenty-five seniors (three percent) having the highest attitude scores and twenty-five with the lowest attitude scores were selected. On each

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1. Krech, David, and Crutchfield, Richard S., Theory and Problems of Social Psychology, 1st edition, New York: McGraw-Hill Book Company, Inc., 1948, pp. 210 ff.
2. Murphy, Gardner, and Likert, Rensis, Public Opinion and the Individual, New York: Harper and Brothers Publishers, 1938, Appendix B.

statement the sum of scores for the high group was compared with that of the low group. It was assumed that the most useful statement would be the one with the greatest difference in total scores between these two groups. Thus statements one to thirty-eight can be ranked in order of their ability to discriminate between these extreme groups. (See Table XXVI.)

This test of internal consistency provides a basis for revising the language of the thirty-eight statements in a future application. Those near the low end of the rank order should be modified and retested.

The validity of the Likert scores has been tested against student behavior, in this instance his choice of employment. Seniors choosing federal employment averaged 2.07 units, those choosing industrial, 1.54. The difference between averages proved to be highly significant statistically (.001 level).

Other similar tests against variables external to the scale also tend to confirm the scale's validity. Students with previous employment experience in industry averaged 1.61, those in federal employment 1.89 (difference significant at .001 level). Those having experience in summer training programs in industry averaged 1.62, in federal 1.86 (difference significant at the .02 level). Finally, seniors with fathers or guardians whose occupation was in industry averaged 1.61 and those whose parents' occupation was in federal employment averaged 1.82 (difference significant at .001 level).

The burden of analysis of seniors' attitudes toward employment rests upon application of the Likert technique. As a further test of this technique scale analysis was performed using a sample of one hundred students. Results of this test are described in Appendix E. It can be noted here that results of the two rankings correlated at a rho of .86.

TABLE XXVI

RANK ORDER OF STATEMENTS ON INTERNAL CONSISTENCY TEST

Rank order	Number of statement on question-naire	Difference between total scores high and low groups	Rank order	Number of statement on question-naire	Difference between total scores high and low groups
1	11	67	19	33	46
2	3	64	21	26	44
3	6	60	22	10	42
3	8	60	22	21	42
3	34	60	24	18	40
6	28	59	25	5	39
7	17	56	25	35	39
8	4	55	27	36	36
9	23	53	28	7	35
10	14	52	29	9	33
10	38	52	29	29	33
12	12	51	31	31	32
12	13	51	32	16	29
14	1	49	33	32	28
14	25	49	34	30	27
16	22	48	35	24	25
17	2	47	36	20	17
17	27	47	37	19	8
19	15	46	38	37	-9

APPENDIX E

GUTTMAN SCALE ANALYSIS TECHNIQUE OF MEASURING ATTITUDE COMPARED WITH LIKERT TECHNIQUE

When the questionnaire was designed, it was decided to employ the Likert scoring schedule technique for assessing students' attitudes toward employment. Interest in the methodology of attitude measurement prompted the researchers to check results of this technique with that of scale analysis.

Scale analysis may be performed by use of a scalogram board[1] or by use of punch cards.[2] The punch card technique was employed in this study.

A random sample of one hundred was selected from the six hundred and sixty seniors. The proportions of all seniors were matched in the sample for college, field of major, and attitude score on the Likert-type scale.

Following the method described by Kahn and Bodine it was discovered that the index of reproductibility was .81. This index falls below the value .90 established arbitrarily as a standard for a reasonable approximation of a "perfect scale." On the other hand, the pattern of error corresponds to the criteria of a "Quasi-scale."[3]

As a result of the scale analysis, students in the sample of one hundred were arranged in rank order. Since these rankings followed a rectangular distribution, they were correlated with those of the Likert-type scale by the rank-order method. Rho, the rank-order coefficient of correlation, was a positive .86. Standard error of rho was .027.

Although further detailed analysis is warranted, this correlation between ranks established by the Likert-type scale and those of the Guttman-type is high enough to render doubtful whether there would be any additional value in using the more refined Guttman technique in this particular study.

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1. Stouffer, Samuel A., and others, Measurement and Prediction, Volume 4 of Studies in Social Psychology in World War II, Princeton: Princeton University Press, 1950. See especially Chapter Four.
2. Kahn, Lessing A., and Bodine, Adolph J., "Guttman scale analysis by means of IBM equipment," Educational and Psychological Measurement, Vol. 11, pp. 298-314.
3. Stouffer, op. cit., p. 159

APPENDIX F

STATISTICAL METHOD OF TESTING EFFECTS OF INSTITUTION AND COLLEGE MAJOR ON ATTITUDE SCORES

Differences in attitude scores were discovered between seniors when grouped by field of college major (see Table XVI). Other differences were discovered when seniors were grouped by institution (see Table XVII). An iterative method of fitting constants has been employed to arrive at scores for the effect of institutions alone and fields alone.[1]

Scores were arranged in fifteen cells (three fields versus five institutions). Differences between real means and computed means were squared and weighted by the number of cases in each cell. This sum of squares was subtracted from the original sum of squares for means, yielding a figure representing the variation explained by the fitted constants. This figure was tested by an F-test and proved to be very highly significant. The "interaction" was barely significant at .05 and the explained variation well above .001.

With the knowledge that the effects of schools and majors were additive, F-tests were conducted for adjusted means by institution and field. Both proved to be very highly significant.

Adjusted means are presented in Table XVIII of the text.

In conclusion it can be stated that inspection of the raw data might lead one to expect that the variation among the mean scores for schools can be explained by the various proportions of engineering students, science students and social science students within each school. However, statistical adjustment indicates that schools lie in the same plane of importance as do the major field in predicting or explaining the average scores of seniors.

There is very little likelihood that the differences between the mean scores for schools or majors can be explained by sampling error.

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1. For detailed explanation of technique see: Snedecor, George W., Statistical Methods, 4th edition, Ames, Iowa: Iowa State College Press, 1946, p. 293 ff. and Guilford, Joy P., Fundamental Statistics in Psychology and Education, 2nd edition, New York: McGraw-Hill Book Company, Inc., 1950, pp. 448 ff.

PREFERENCES OF COLLEGE SENIORS IN CHEMISTRY CONCERNING EMPLOYMENT IN INDUSTRY AND GOVERNMENT

by

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(A paper presented at the American Chemical Society's Atlantic City Meeting. Symposium on "Recruitment of Chemists", September 17, 1952.)

The high degree of technological development achieved in our American society has dramatized the importance of our human resources. Today, perhaps even more than in the past, day-to-day operation of industrial, educational, governmental and other important organizations has become critically dependent upon the knowledge and skills of persons highly trained in science, engineering, social science and other fields.

It is in our common interest to be concerned about the development, distribution, effective use, and conservation of our human resources. So today we find educators, industrial leaders, government officials, professional people, and many others studying our human resources.

The American University under contract with the Office of Naval Research, has sought to study one crucial factor in the distribution of our human resources, that is: the employment preferences of college students. Colleges and universities play an important role in the development of highly trained men and women. The distribution of these highly trained persons among the social organizations dependent upon their knowledge and skills is influenced by many factors, one of which is the individual college senior's preference concerning the various employment opportunities open to him. Cooperative effort to meet the manpower needs of industry, educational institutions, and government is dependent upon a more precise understanding of how college students choose specific jobs.

We have restricted our study to college seniors majoring in three fields of engineering: civil, mechanical, and electrical; two fields of science; chemistry and physics; and three fields of social science: economics, political science, and psychology.

A pilot study was conducted in the Spring Semester of 1951. It was directed toward engineering majors only, and

was conducted at six colleges or universities. Dr. George P. Bush, the principal investigator for that study, presented his findings in July 1951 in a report entitled Engineering Students and Federal Employment. A summary article by Drs. Bush and Battery entitled "Federal Recruitment of Junior Engineers", appeared in Science in November 1951.

Our second approach to the problem was made this Spring. The scope of the study was extended to include science and social science majors as well as engineering majors. Five colleges or universities were visited. One college was included in both studies so in all we have visited ten colleges or universities.

These studies have provided opportunity to contact placement officers, deans, other administrative officials, and faculty members familiar with student employment preferences and the recruitment efforts of organizations seeking college level talent. However, I shall not be able to summarize our interviews with these people in this brief paper.

The first visits to college campuses were exploratory. We obtained a large volume of student and faculty comment concerning the advantages and disadvantages of federal and industrial employment in their fields of training. The frequency of favorable response both in six hundred questionnaires and seventy-eight interviews was greater for industrial than for federal employment. Perhaps our most significant findings concerned the dissatisfaction students held toward the personnel policies and procedures of federal agencies and the unfavorable competitive position of federal recruiters, when compared with industrial recruiters. However, the point of departure for our study this spring was the description of student and faculty attitudes concerning employment which were discovered and documented in our first study.

As in the first study, we visited colleges and universities which were chosen carefully to represent diverse environmental factors. The visits were made during the last few weeks of the seniors' final semester when their impressions of recruitment and memory for their own employment decisions were still fresh. Many interviews were obtained, but our accent was upon the use of a pre-tested questionnaire built upon the experience and findings of our first study. Six hundred and sixty seniors and one hundred and seven faculty members completed questionnaires which were administered on the campuses of the five participating schools.

Our purposes were, (1) to describe and analyze student preferences for industrial employment compared with civilian employment in the federal government, and (2) to describe and analyze student's employment decisions in the light of these preferences.

With this background information behind us, let us turn to a preview of some of the findings. First of all, which type of employment did the seniors and faculty members favor, and how strongly?

Attitudes toward industrial and federal employment.

Before answering these questions I would like to present a brief description of the method used in measuring the degree of favor or disfavor to help clarify our findings. Student and faculty preferences for industrial and federal employment in their respective fields were measured by an attitude scoring technique. Each person compared industrial with federal employment by responding to thirty-eight statements. These statements had been constructed by paraphrasing student and faculty comments describing the most important advantages and disadvantages of federal and industrial employment obtained in the previous study.

In order to respond to a statement each person had to compare industrial employment with federal employment and judge the degree to which such employment was favorable to him as respects the subject matter of the statement. Of course, he could also indicate neutrality or no opinion. His response to all thirty-eight statements was then averaged to provide a measure of his degree of favor toward industrial employment, his neutrality, or his degree of favor toward federal employment.

A few typical statements from the questionnaire may give perspective at this point. The individual was asked whether he (1) strongly agrees, (2) tends to agree, (3) neither agrees nor disagrees, (4) tends to disagree, or (5) strongly disagrees with such statements as the following:

> Students with training similar to mine are more inclined to work in private employment than for the federal government.
>
> There is a better chance for me to develop professionally in the federal civil service than in private industry.

Students interested in research work in my field will find greater opportunity in federal employment than in private industry.

In my field management efficiency is greater in private industry than in government.

Response to these and thirty-four similar questions can be summarized as follows: Although some individuals' scores were more favorable towards federal than industrial employment, the group of all seniors was more favorable toward industrial employment than toward federal employment. Faculty members also were more favorable toward industrial employment than they were toward federal employment. However, the average for seniors was significantly more favorable to industrial and less favorable to federal employment than that of the faculty. In other words, faculty attitudes were closer to neutrality than those of the seniors.

We cannot trace the relationship of faculty attitudes to student attitudes at this time, nor explain in detail the basis of this negative attitude toward government employment. But that the aggregate of student and faculty attitude is negative toward civilian employment in the federal government when compared with industrial employment is well documented.

Analysis of seniors grouped by field of their college major disclosed that the average score of chemistry majors was not significantly different from the average score of all seniors. However, mechanical engineering majors were more favorable toward industrial employment than any other group. Civil engineers and electrical engineers were also more favorable to industry than the average of all seniors. Other students, physics, economics, and psychology majors, although favorable to industry, were less favorable than the average for all seniors. Only the political science majors indicated stronger favor for federal employment than for industrial employment. But even though favorable toward federal employment, this group's average attitude score was very close to neutrality.

One basis for closer examination of the degree of favor toward industrial or federal employment is provided by scoring two special groups of seniors. One, those who had accepted or expected to accept industrial employment. And two, those who had accepted or expected to accept federal employment.

These groups had translated their preferences into decisions so we can use their average scores to interpret

our findings. Using the attitude averages of these two groups, we observe that neither the attitude of all seniors nor all faculty was as strongly favorable to industrial or federal employment as the groups having accepted or expecting to accept employment in these respective fields. Thus, both major groups are located between the averages of these landmark groups.

The attitude of chemistry majors also averaged between the average scores of these groups. On the other hand, mechanical engineering majors were as favorable to industrial employment as those students who accepted or expected to accept industrial employment. And political science majors were as favorable to federal employment as those who accepted or expected to accept federal employment.

We can summarize this information concerning the degree of favor toward industrial or favor toward federal employment by saying that the average attitude score of seniors indicates definite preference for industrial employment. Faculty members also favor industrial employment but not to the same degree since their average is closer to neutrality. Neither seniors nor faculty members average as high a degree of favor to industry as that of the group of students who have accepted jobs in industry or expect to accept jobs in industry.

Only mechanical engineering majors are as favorable to industrial employment as this group. Majors in chemistry are as favorable toward industrial employment as the average of all seniors. Only political science majors are as favorable to federal employment as those entering such employment. Majors in other fields range between these limits.

Now, let us turn to the considerations which students regarded to be most important in choosing a job.

Most Important Considerations in Accepting Employment

After responding to the statements comparing federal and industrial employment, each person was asked to indicate what he thought was the most important consideration in the final choice of a job. Approximately thirty per cent of all seniors indicated that a general preference for the specific job was their first consideration. They expressed this in various ways, saying, "You must like the job," or like the "nature of the work," or "find satisfaction" in it, or "enjoy the type of work."

Opportunity for advancement through promotion was chosen by approximately twenty per cent as the most important consideration. Pay and professional development were chosen by approximately seven per cent each and rank 3rd and 4th in consideration. Job security and working conditions were first in importance with about five per cent each. It is interesting to note that benefits, that is vacation with pay, sick leave policy, and retirement, were not regarded as the most important consideration by any senior.

Chemistry majors rank employment considerations in the same order as all seniors with the exception that working conditions are in third place rather than sixth.

This picture of the most important consideration in the final choice of employment presents a point of reference from which the response of favor-disfavor toward industrial and federal employment can be assessed.

For example, the first most important consideration was general preference for the specific job. Response of all seniors to attitude statements measuring general preference was more favorable to industry than to any other group of statements. Student response to statements concerning general preference also averaged decidedly more favorable to industry than the average of all students who had accepted or expected to accept jobs in industrial employment. This was also the case with statements concerning pay.

On the other hand, response to two groups of statements was more favorable to government employment than the average score of the group which accepted or expected to accept federal employment. But these were benefits and job security. Benefits were not considered the most important consideration by any senior. Job security was rated the most important consideration for final acceptance by only five per cent of the seniors.

In other words, seniors regarded industrial employment as more favorable than federal employment in the considerations which are most important to them in choosing a job.

Our study also included analysis of the available sources of information about specific jobs.

Sources of Information about Specific Jobs

One crucial phase in industrial and federal recruitment is the communication process by which students learn about

specific job opportunities. Seniors were asked to indicate the most important source of information concerning specific jobs. Two sources were chosen by approximately twenty per cent each as the most important sources of information concerning specific federal jobs. The first was the college placement office and the second - newspapers, radio, and television combined. Representatives who visited the campus were ranked third and faculty members of the student's department - fourth. Other students were regarded to be the most important source by eight per cent, and family by seven per cent.

Chemistry majors differed from the pattern for all seniors by ranking other students third instead of fourth and a smaller percentage of them regarded their families as an important source of information about specific federal jobs.

Contrary to their ranking of sources of information about specific federal job opportunities, the seniors ranked representatives who visited the campus, first in importance as a source concerning specific industrial job opportunities. College placement offices ranked second and all other sources were considered the most important source by less than ten per cent each. Again the chemistry majors ranked the sources in approximately the same order of importance as did the seniors as a whole.

When seniors were asked to indicate their most important source of information or advice for deciding the advisability of accepting a specific job, they again ranked the representative who visited the campus as most important. However, faculty members in the student's department ranked second and family third.

The student's view of his sources of information provides a contrast between federal and industrial recruitment efforts. Notice that the most important source of information and advice concerning the advisability of accepting employment was the representative who visited the campus. For industrial jobs, students regarded the representative to be the most important source of information. In contrast, the most important source of information concerning federal jobs was the placement office, general news sources ranked second and representatives third.

With this background concerning the student's employment preference and sources of information let us turn to a description of the employment decisions made by the group of students under analysis.

Employment Decisions

Contrary to what we had expected, only thirty-eight per cent of the seniors had definitely accepted a job at the time of our visits to the colleges in late April and early May. Furthermore, approximately sixty per cent of those who had accepted, had accepted either in April or May. Thus recruitment efforts as late as April or May seem warranted even though some students said they had definitely accepted jobs a year or more before this time.

Approximately sixteen per cent of the seniors expected to go into the armed services and twenty-two per cent into graduate or professional study. Two per cent of the seniors did not answer questions concerning their decisions.

The remaining twenty-two per cent had not yet accepted jobs. However, the majority of them expected to accept jobs by May or June, although some expected to decide at the end of this summer, and a few still later.

Going back to the group which had definitely accepted employment by the time of our visit we find that seventy-eight per cent of these seniors regarded their jobs to be in industrial employment. Only five per cent of the jobs were federal, and only five per cent were in education. Ten per cent of the jobs were in other fields, and two per cent of the students did not answer this question.

Majors in chemistry differ significantly from this pattern for all seniors in that fewer jobs were located in industry and more, twenty-six per cent, in education. This difference may be related to the discovery, not previously mentioned, that a greater proportion of the chemistry majors were going on into graduate study than were seniors generally. Perhaps they are combining teaching or research with their graduate studies.

Thus both seniors generally and chemistry majors specifically, accepted many more jobs in industry than in other fields. But, proportionately more chemistry majors went into education and graduate school than did seniors generally.

Analysis of those seniors who had not accepted jobs at the time of our visit illustrates similar employment preferences. For all seniors in this category, fifty-one per cent expected to accept jobs in Industry, ten per cent in Federal government, and eight per cent in Education. Again

ten per cent used classifications other than these and twenty-two per cent did not indicate the field in which they expected to locate. Chemistry majors did not differ significantly from these percentages.

Pay is regarded to be an important factor in occupational choice. Our first study in 1951 of engineering students indicated that pay was considered to be a disadvantage of federal employment and an important advantage of industrial employment. We have already noted that our study this spring indicated that pay was regarded as the most important factor in choosing a job by only seven per cent of the seniors. On the other hand seniors indicate a strong favor for industrial employment when responding to statements concerning pay. Their response on these questions was more favorable to industry than the average score of the group choosing industrial work.

Within this setting it is interesting to note that the average annual salary for the group of seniors who had definitely accepted employment was $4015, that is, about $335 per month. Approximately one per cent of those with jobs said their annual salaries were $3000 or below. Forty per cent ranged between $3000 and $3999. Forty-three per cent ranged between $4000 and $4999. Five per cent of the seniors said their annual salaries were $5000 or above. Eleven per cent of those with jobs did not respond to this question.

Twenty-six per cent of the chemistry majors who had accepted jobs indicated an annual salary of less than $3000. Presumably these were the students going into educational employment, perhaps combining it with graduate study. The rest of those with jobs averaged $3883 per year, about $324 per month. Thus, chemistry majors accepted lower starting salaries than the average for those seniors included in this study.

Summary

In summary I would like to say that this paper represents a preview of a few of the findings to be presented in our full report which is now in preparation. We have seen that the climate of attitude among the college seniors included in this study is favorable to industrial employment. This climate is reflected in employment decisions where we find that educational employment and civil employment in the federal government were chosen by approximately five per cent each of those who had accepted jobs and by approximately ten per cent each of those who had not yet accepted. This description of the distribution of college talent will require continued analysis and evaluation by us all.

APPENDIX H

AVERAGE SCORES BY STATEMENTS FOR SENIORS, GRADUATE STUDENTS AND FACULTY

Statement	Senior score	Graduate score	Faculty score
1. Students with training similar to mine are more inclined to work in private employment than for the federal government.	0.95	1.04	1.25
2. Employment in my field in a business or industrial concern is more likely to be permanent than employment in a federal organization.	2.12	2.02	2.19
3. There is a better chance for me to develop professionally in the federal civil service than in private industry.	1.13	1.40	1.38
4. Experience gained in federal employment in my field is more varied than that gained in private industry.	1.50	1.90	1.69
5. Experience gained in federal employment becomes a poor recommendation for future work in industry.	2.56	2.56	2.58
6. Opportunities for additional training in my professional field are greater while working in private industry than in government.	1.55	2.31	2.07
7. A person working for the federal government in my field has greater job security than in private industry.	2.29	2.07	2.46
8. Students interested in research work in my field will find greater opportunity in federal employment than in private industry.	1.92	1.80	2.02

Statement	Senior score	Graduate score	Faculty score
9. Positions in the federal civil service are poorly located geographically for me, when compared with those in private industry.	2.19	2.21	2.12
10. The federal civil service provides more opportunity to select the geographic location of your work than does private industry.	1.65	1.66	1.56
11. In my field a greater variety of positions is offered by the federal civil service than by private industry.	1.41	1.36	1.58
12. In my field management efficiency is greater in private industry than in government.	1.09	1.38	1.26
13. In other fields as well as in my own field, management efficiency is greater in private industry than in government.	1.04	1.27	1.28
14. A person's immediate supervisors are more likely to be competent in federal government employment than in private industry.	1.19	1.26	1.23
15. Working conditions in the federal government are better than in private industry.	1.95	1.90	1.90
16. Private industry provides better equipment for technical work than is found in federal agencies performing similar work.	2.24	2.31	2.22
17. In my field, individual initiative on the job is given higher recognition in government than in similar industrial work.	1.21	1.21	1.24
18. Professional people working for the federal government encounter more "red tape" than those working in industry.	1.07	1.21	1.16

	Statement	Senior score	Graduate score	Faculty score
19.	The individual works "under pressure" more frequently in government than in private industry.	2.71	2.86	2.78
20.	A person in my field doesn't have to work as hard in private industry as in government.	1.11	1.21	1.21
21.	The federal government provides greater incentive for the employee to work than private industry.	0.940	1.00	0.982
22.	Starting salaries are more likely to be adequate in federal government than in private industry.	1.29	1.33	1.49
23.	Pay is more dependent upon ability in private industry than in government.	1.07	1.21	1.09
24.	Pay for the higher level positions in my field is likely to be greater in industry than in government.	0.743	0.677	0.850
25.	A career in federal civil service offers greater opportunity for long range financial return than a similar career in private industry.	1.43	1.43	1.27
26.	Increases in pay occur more frequently in government than in private industry.	1.56	1.62	1.54
27.	Advancement by promotion is more rapid in government than in industry.	1.50	1.61	1.44
28.	Promotions are more often based upon merit in industry than in government.	1.25	1.46	1.31

Statement	Senior score	Graduate score	Faculty score
29. Vacation with pay policy is more liberal in government than in industry.	2.56	2.81	2.56
30. Sick leave policy is more liberal in industry than in government.	2.50	2.61	2.42
31. Government offers a more beneficial retirement system than industry.	2.36	2.25	2.20
32. Students in my field are more familiar with the facts about federal employment than they are about private employment.	1.32	1.60	1.54
33. Working conditions in the federal civil service are better than in private industry.	1.92	1.94	1.99
34. Students not having "pull" make out better in industry than in the federal civil service.	2.11	2.35	2.08
35. One's personal beliefs are more likely to affect his chances of obtaining government employment than industrial employment.	1.90	2.05	2.10
36. Discrimination against the individual is more likely in private industry than in government.	2.24	2.44	2.30
37. It takes less effort to obtain a job with the federal government than to obtain a job with industry.	1.93	2.00	1.71
38. Students with the greatest ability are more likely to enter private industry than government service.	0.880	1.12	1.16